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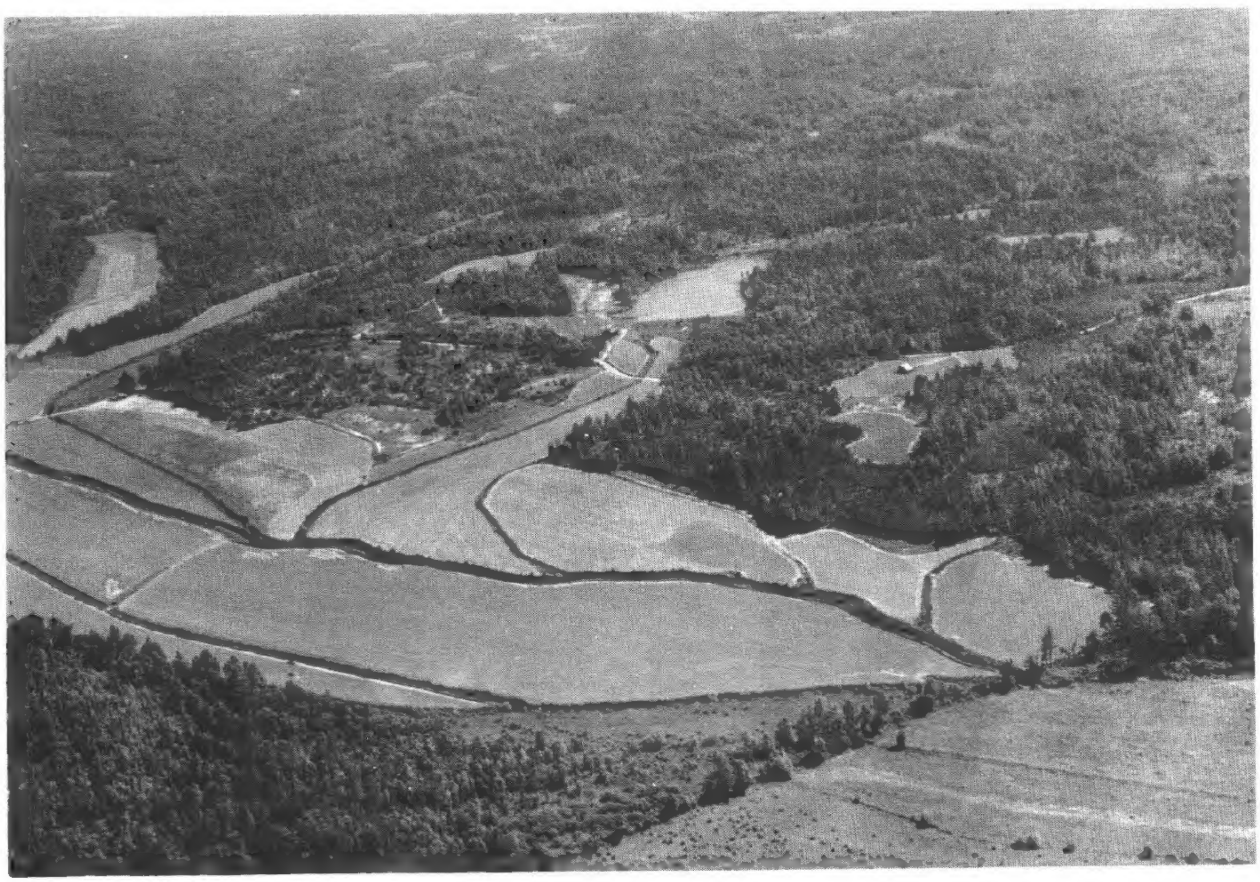
SOIL SURVEY
Tippah County Mississippi



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
in cooperation with
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

HOW TO USE THIS SOIL SURVEY REPORT

THIS SOIL SURVEY of Tippah County, Miss., will serve several groups of readers. It will help crop and livestock farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, lakes, ponds, and other structures; aid managers of forest and woodland; add to the soil scientists' knowledge of soils; and help prospective buyers and others in appraising a farm or other tract.

Locating the Soils

At the back of this report is an index map and a soil map consisting of many sheets. On the index map are rectangles numbered to correspond to the sheets of the soil map, so that the sheet showing any area can be located easily. On each map sheet, the soil boundaries are outlined and there is a symbol for each kind of soil. The soil symbol is inside the area if there is room enough; otherwise, it is outside the area and a pointer shows where it belongs. For example, an area on the map has the symbol FkA. The legend for the set of maps shows that this symbol identifies Falkner silt loam, 0 to 2 percent slopes. That soil and all others mapped in the county are described in the section "Descriptions of Soils."

Finding Information

In the "Guide to Mapping Units" at the back of this report, the soils are listed in the alphabetic order of their map symbols. This guide shows where to find a description of each soil and a discussion of its capability unit and woodland group. It also shows where to find the acreage of each soil, the yields that can be expected, and information about engineering uses of soils.

Farmers and those who work with farmers can learn about the soils on a farm by reading the description of each soil and of its capability unit and other groupings. A convenient way of doing this is to turn to the soil map and list the soil symbols on a farm and then to use the "Guide to Mapping Units" in finding the pages where each soil and its groupings are described.

Foresters and others interested in woodland can refer to the section "Woodland." In that section the soils in the county are placed in groups according to their suitability for trees, and the management of each group is discussed.

Game managers, sportsmen, and others concerned with wildlife will find information about the main kinds of wildlife and their food and cover in the section "Use of Soils for Wildlife and Fish."

Engineers and builders will find, in the section "Use of Soils for Engineering," tables that give engineering descriptions of the soils in the county, name soil features that affect engineering practices and structures, and rate the soils according to their suitability for several kinds of engineering work.

Scientists and others who are interested can read about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Tippah County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the County."

* * * * *

Fieldwork for this survey was completed in 1963. Unless otherwise mentioned, all statements in the report refer to conditions in the county at the time the survey was in progress. The soil survey was made cooperatively by the U.S. Department of Agriculture and the Mississippi Agricultural Experiment Station. It is part of the technical assistance given by the Soil Conservation Service to the Tallahatchie River and Northeast Mississippi Soil Conservation Districts.

Cover picture.—Aerial view of dam across Tallahatchie River. Note intensive use of bottom land.

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Series 1963, No. 1

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SOIL SURVEY OF TIPPAH COUNTY, MISSISSIPPI

BY WILLIAM E. BRIGHT, WILLIAM I. SMITH, MALCOLM C. TYLER, W. L. WATTS, R. C. CARTER, H. S. GALBERRY, AND W. W. NYE, [1] SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

TIPPAH COUNTY is in the extreme northern part of Mississippi (fig. 1), adjacent to Tennessee, and covers approximately 464 square miles. It is about 27½ miles from north to south and about 21 miles across at the widest part from east to west.

The county is within two major physiographic regions, the Interior Flatwoods and the Upper Coastal Plain. The Interior Flatwoods region is about 4 miles wide. It extends through the central part of the county, entering from Union County to the south and extending into Tennessee to the north. The east and west sides of the county, on either side of the Interior Flatwoods, are in the Upper Coastal Plain.

The soils of the Interior Flatwoods consist of a thin layer of silty loess over dense, gray, acid clay. Many of the broad interstream ridges are gently sloping. The side slopes of the ridges are generally moderately sloping to strongly sloping. Erosion is slight on the gentle slopes and moderate to severe on the moderate to strong slopes. The bottom lands are broad. Much of the area of the Interior Flatwoods is still in woodland, but appreciable acreages have been cleared and are used as cropland or pasture. Surface drainage is needed to make the bottom lands suitable for intensive use.

A thin layer of loess covers most ridgetops in the Upper Coastal Plain area. The side slopes are steep to very steep. Most of the soils on these slopes consist of weathered, acid Coastal Plain sandy material, acid Coastal Plain clay, or alternate thick or thin layers of each. Both sheet and gully erosion are very severe where the native vegetation has been cleared.

Parts of the alluvial land formed by the Hatchie River, Muddy Creek, and Tippah Creek are in the Upper Coastal Plain. Most of this alluvial land is somewhat poorly drained, but that near steep hills ordinarily is poorly drained, and that along old stream channels generally is moderately well drained.

The Tallahatchie River, the Hatchie River, and Tippah Creek drain the county. The Tallahatchie River drains the area south of Blue Mountain and eastward to Dumas. Tippah Creek drains the south-central and west-central parts of the county. The Hatchie River and its tributaries drain the northern and eastern parts of the county.

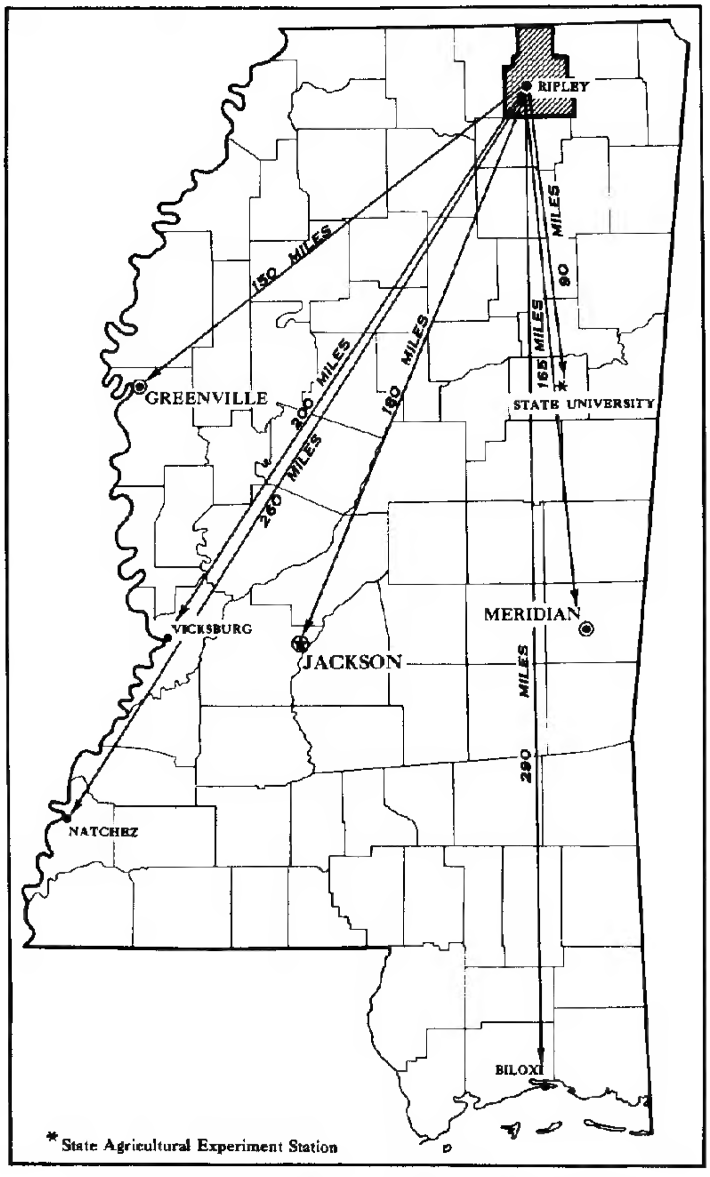

Figure 1.—Location of Tippah County in Mississippi.

[1] Most of this report is by WILLIAM E. BRIGHT. M. H. HAYNES, agricultural engineer, Soil Conservation Service (SCS), prepared the section "Use of Soils for Engineering," assisted by other engineers of SCS, by engineers of the United States Bureau of Public Roads and the Mississippi State Highway Department, and by soil scientists of SCS. TRAVIS R. TAYLOR, agronomist, SCS, helped write the section "Use of Soils for Agriculture." The section "Woodland" is by R. L. GRIGSBY, woodland conservationist, SCS. The section "Use of Soils for Wildlife and Fish" is by EDWARD G. SULLIVAN, biologist, SCS. MAX R. GOODMAN, geologist, SCS, prepared the section "Geology." WILLIAM E. BRIGHT, WILLIAM I. SMITH, and MALCOLM C. TYLER were party leaders at different times while the field survey was in progress.

The agriculture of Tippah County consists mainly of growing cotton, corn, soybeans, and small grain, and of raising dairy and beef cattle and poultry. Forestry is also important. Nearly two-thirds of the county is very steep or severely gullied and is suitable only for growing trees.

About 2,150 people in Tippah County are employed in agricultural enterprises. Nine industries in Ripley and six in other locations employ approximately 1,000 people. Workers in wholesale and retail trades, service occupations, government, transportation, communication, utilities, and other occupations increase the number of employed persons in the county to about 5,000. In 1960 the total population was 15,038.

How This Soil Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Tippah County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Falkner and Ora, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the natural, untouched landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Ora loam and Ora silt loam are two soil types in the Ora series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Providence silt loam, 5 to 8 percent slopes, eroded, is one of several phases of Providence silt loam, a soil type that ranges from gently sloping to strongly sloping and is moderately eroded or severely eroded.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed and occur in such small individual tracts that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Dulac-Wilcox complex, 8 to 12 percent slopes. On some detailed maps, the soil scientist shows two or more soils as one mapping unit, if the differences between the soils are not sufficient to justify separation for the purposes of the soil survey report. Such a mapping unit is called an undifferentiated group. Waverly and Bibb soils is an example. Another kind of mapping unit is the soil association. It is a large acreage that consists of two or more soils and is uniform in pattern and proportion of the dominant soils, though the soils in it can differ greatly. Some of the soils in the rough and relatively inaccessible parts of Tippah County were mapped as associations. Ruston-Cuthbert association, moderately steep, is an example.

Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gullied land, clayey, and Mixed alluvial land, and are called land types rather than soils.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to

different groups of readers, among them farmers, ranchers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil survey reports. The soil scientists set up trial groups based on the yield and practice tables and other data. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then they adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

After study of the soils in a locality and the way they are arranged, it is possible to make a general map that shows several main patterns of soils, called soil associations. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic although not strictly uniform.

The soils within any one association are likely to differ from each other in some or in many properties; for example, slope, depth, or natural drainage. Thus, the general soil map shows, not the kind of soil at any particular place, but patterns of soils, in each of which there are several different kinds of soils.

Each soil association is named for the major soil series in it, but, as already noted, soils of other series may also be present. The major soils of one association may also be present in another association, but in a different pattern.

The general map showing patterns of soils is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use. The five soil associations in Tippah County are discussed in the paragraphs that follow.

1. Wilcox-Dulac-Falkner association

Somewhat poorly drained and moderately well drained silty and clayey soils of the Interior Flatwoods

This is an area of wide, flat ridges; short side slopes; and narrow stream bottoms (fig. 2). The flat ridges are several miles long and are mostly one-eighth to one-half of a mile wide. The stream bottoms are ordinarily less than one-fourth of a mile wide. The gradient of the side slopes between the ridges and stream bottoms is generally less than 17 percent.

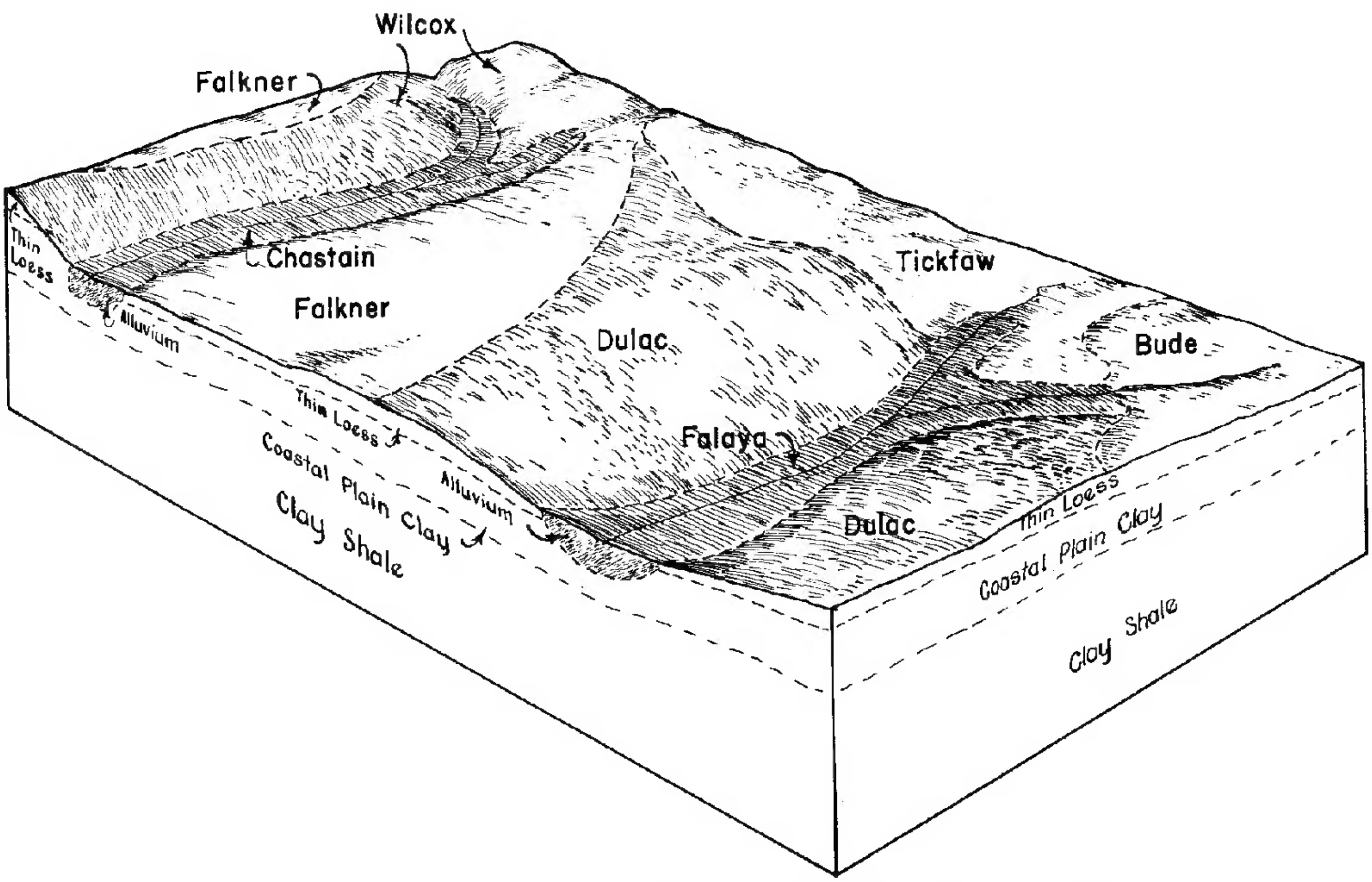

Figure 2.—Distribution and pattern of major soils in Wilcox-Dulac-Falkner association.

Wilcox soils are on the more gentle side slopes. They are somewhat poorly drained and have a loamy surface layer and a plastic clay subsoil. Dulac and Falkner soils are on the ridgetops and upper side slopes. They have a silty surface layer and a silty clay loam subsoil. Dulac soils have a fragipan at a depth of about 2 feet and are moderately well drained. Falkner soils are somewhat poorly drained. Wilcox soils cover about 35 percent of the association, Dulac soils 20 percent, and Falkner soils 20 percent.

Cuthbert soils, which occupy about 15 percent of the association, are on the steeper side slopes. They have a loamy surface layer and a plastic clay subsoil that is mottled in the lower part. Falaya, Collins, Chastain, and Waverly soils are on the stream bottoms and occupy less than 10 percent of the association.

Most of this association has been cleared of trees and has been row cropped at some time. The ridgetops and the stream bottoms are well suited to and moderately productive of cotton, corn, and soybeans. The steep side slopes, where the erosion hazard is severe, are well suited to pine trees. The side slopes are not cultivated now and are reverting to trees.

The farms in this association ordinarily are of the cash-crop type and are about 80 acres in size. Cotton, corn, and soybeans are the dominant cash crops. The largest acreages of these crops are on the stream bottoms. Interest in dairying has increased in recent years, and at present there are a number of dairy farms in the area. Most farmers obtain a large part of their income from off-the-farm employment.

The soils in this association are not suitable sites for buildings and roads. They shrink and swell with changes in moisture content, and consequently foundations are likely to fail.

2. *Mantachie-Bibb association*

Somewhat poorly drained and poorly drained sandy soils on wide stream bottoms

This is an area of flat stream bottoms and gently sloping terraces along the Hatchie River and Dry Run (fig. 3). The stream bottoms are commonly more than half a mile wide. The terraces are generally less than one-fourth of a mile wide.

Mantachie soils occur as broad areas on the stream bottoms, some distance from the natural stream channels. They are somewhat poorly drained and have a loamy surface layer and mottled, loamy subsurface layers. Bibb soils are near steep bluffs and also in broad depressions. They are poorly drained and predominantly sandy. Mantachie soils cover about 45 percent of the association, and Bibb soils about 10 percent.

Iuka soils and Mixed alluvial land are adjacent to old natural stream channels. Iuka soils are predominantly sandy throughout and are well drained. Mixed alluvial land consists of well-stratified stream deposits of silt and sand and is somewhat poorly drained or moderately well

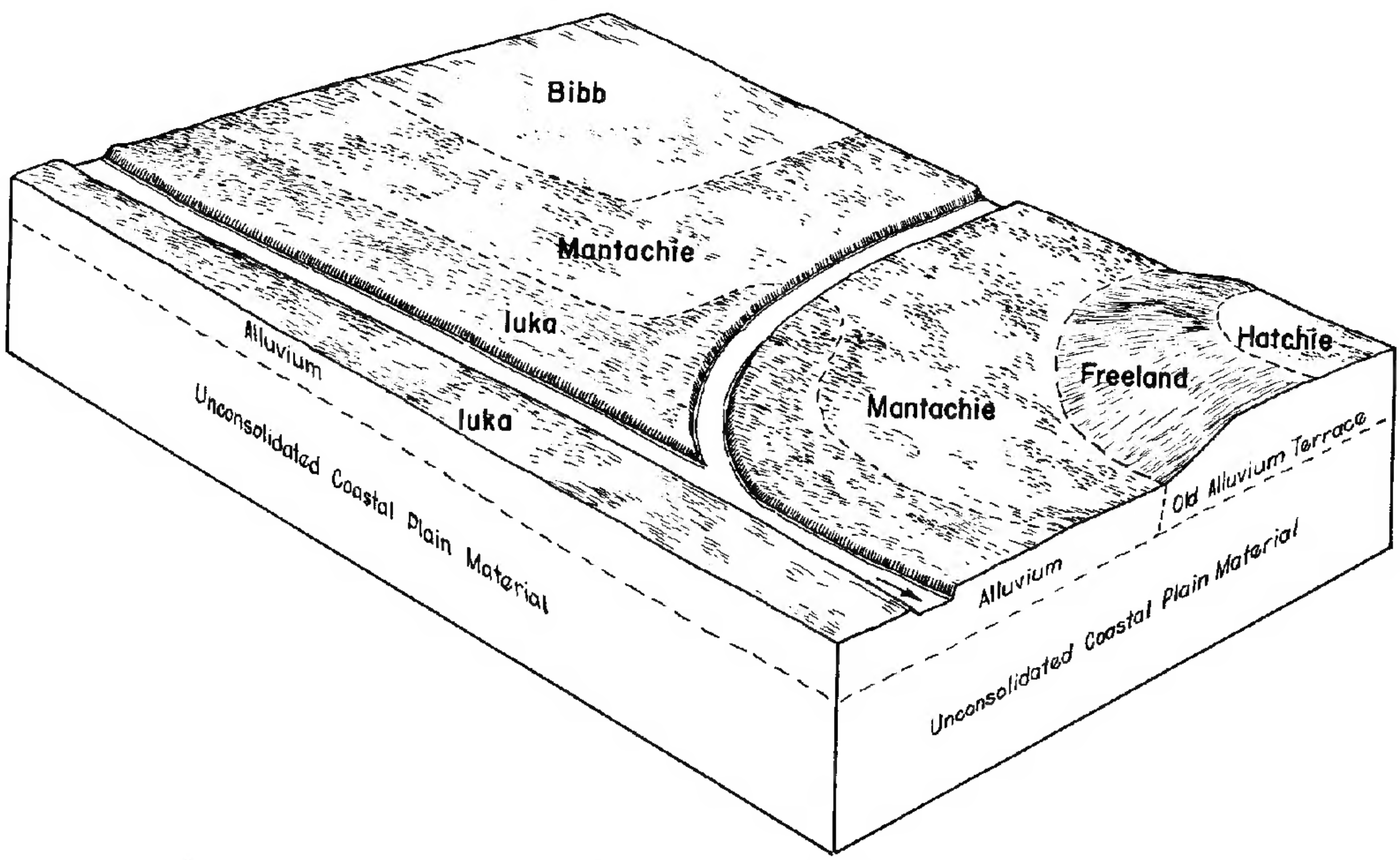

Figure 3.—**Distribution and pattern of major soils in Mantachie-Bibb association.**

drained. Freeland and Hatchie soils are on the gently sloping stream terraces. They occupy less than 10 percent of the association. Iuka soils cover 15 percent of the association, and Mixed alluvial land 20 percent.

A large part of this association has been cleared of trees and used for row crops. Much of the acreage that is poorly drained is now grazed but is reverting to trees.

The farms in this association ordinarily are of the cash-crop type and are about 100 acres in size. The dominant crops are cotton, corn, and soybeans. In recent years interest in dairying and poultry production has increased, and at present there are a number of dairy farms and small commercial poultry farms in the area. Many farmers obtain a large part of their income from off-the-farm employment.

The soils on the stream bottoms and terraces are well suited to cotton, corn, and soybeans and are moderately productive of these crops. In the lower lying areas, ditches are needed to remove excess water. Flooding, which is the main hazard, sometimes damages roads, bridges, fences, and crops.

3. Ruston-Cuthbert-Ora association

Well drained and moderately well drained sandy soils

This is an area of steep and very steep, long side slopes; narrow, rolling ridgetops; and narrow stream bottoms. The stream bottoms are generally less than one-fourth of a mile wide. The side slopes between the ridges and stream bottoms are long and wide and ordinarily have slopes of more than 17 percent. Many of the ridgetops are less than one-eighth of a mile wide.

Ruston soils are on the side slopes. They are well drained and have a sandy surface layer and a sandy clay loam subsoil. Adjacent to the larger areas of Ruston soils are patches of Cuthbert soils, which also are on the side slopes. Cuthbert soils are moderately well drained and have a sandy loam surface layer and a thin clayey subsoil over mottled, plastic sandy clay. Ora soils are on the ridgetops and upper side slopes. They are moderately well drained. They have a silty surface layer, a loamy subsoil, and a sandy fragipan at a depth of about 2 feet. Ruston soils cover about 35 percent of the association, Cuthbert soils 20 percent, and Ora soils about 20 percent.

Mantachie, Bibb, and Iuka soils are on the stream bottoms. They occupy less than 15 percent of the association. Shubuta soils are on side slopes and occupy less than 10 percent.

Many of the steep side slopes have never been cleared of trees. The large areas of steep land that have been cleared and row cropped have been severely damaged by gully erosion. Most of the side slopes, many small ridges, and many of the stream bottoms subject to overflow are reverting to trees.

The farms in this association ordinarily are of the cash-crop type and are about 175 acres in size. The dominant crops are cotton and corn. They are grown mainly on the stream bottoms. Most of the farmers obtain a large part of their income from off-the-farm employment.

The ridgetops and the stream bottoms are well suited to cotton and corn and are moderately productive of these crops. The steep and very steep side slopes, where the erosion hazard is severe, are well suited to pine trees. Ruston and Ora soils are relatively stable for foundations of roads and buildings. They ordinarily overlie generous quantities of good-quality "road metal" material.

4. Ruston-Cuthbert-Providence association

Well drained and moderately well drained sandy and silty soils

This is an area of long, steep and very steep side slopes; long, rolling ridges; and narrow stream bottoms (fig. 4). Many of the rolling ridges are less than one-eighth of a mile wide. The stream bottoms are generally less than one-fourth of a mile wide. The side slopes between the ridges and the stream bottoms are long and wide. In many places the slope is more than 17 percent.

Ruston soils are on the side slopes, generally on the upper part of the slope. They are well drained and have a sandy loam surface layer and a sandy clay loam subsoil. Cuthbert soils commonly occupy the lower part of the side slopes. They are moderately well drained and have a loamy surface layer and a plastic clay subsoil that is mottled in the lower part. Providence soils are on the ridgetops and the upper part of the side slopes. They are moderately well drained. They have a silt loam surface layer, a silty clay loam subsoil, and a silty fragipan below a depth of 2 feet. Ruston soils cover 35 percent of the association, Cuthbert soils 30 percent, and Providence soils about 15 percent.

Falaya, Waverly, Chastain, Collins, and Urbo soils are on the stream bottoms. Their combined acreage is less than 20 percent of the association.

Many of the steep side slopes have never been cleared of trees. The large areas that were cleared and plowed are now covered with an intricate pattern of deep gullies. Most of the side slopes are reverting to trees.

The farms in this association ordinarily are of the cash-crop type and are about 160 acres in size. The dominant crops are cotton and corn. They are grown mainly on the stream bottoms. In recent years interest in dairying has increased, and at present there are a number of dairies in the area. Many farmers obtain a large part of their income from off-the-farm employment.

The ridgetops and the stream bottoms are well suited to corn and cotton and are moderately productive of these crops. The steep and very steep side slopes, where the erosion hazard is severe, are well suited to pine trees.

5. Falaya-Urbo-Waverly association

Somewhat poorly drained and poorly drained silty and clayey soils on wide stream bottoms

This is an area of wide, flat stream bottoms and gently sloping stream terraces along Tippah Creek and Muddy Creek (fig. 5). The terraces are ordinarily less than one-fourth of a mile wide, and the stream bottoms are more than half a mile wide.

Falaya soils occur as broad areas on the stream bottoms, generally some distance from the natural stream channels. They are somewhat poorly drained. They have a silt loam surface layer and mottled, heavier silt loam subsurface layers. Urbo soils also occur as large areas, are some distance from old natural stream channels, and are somewhat poorly drained. They ordinarily

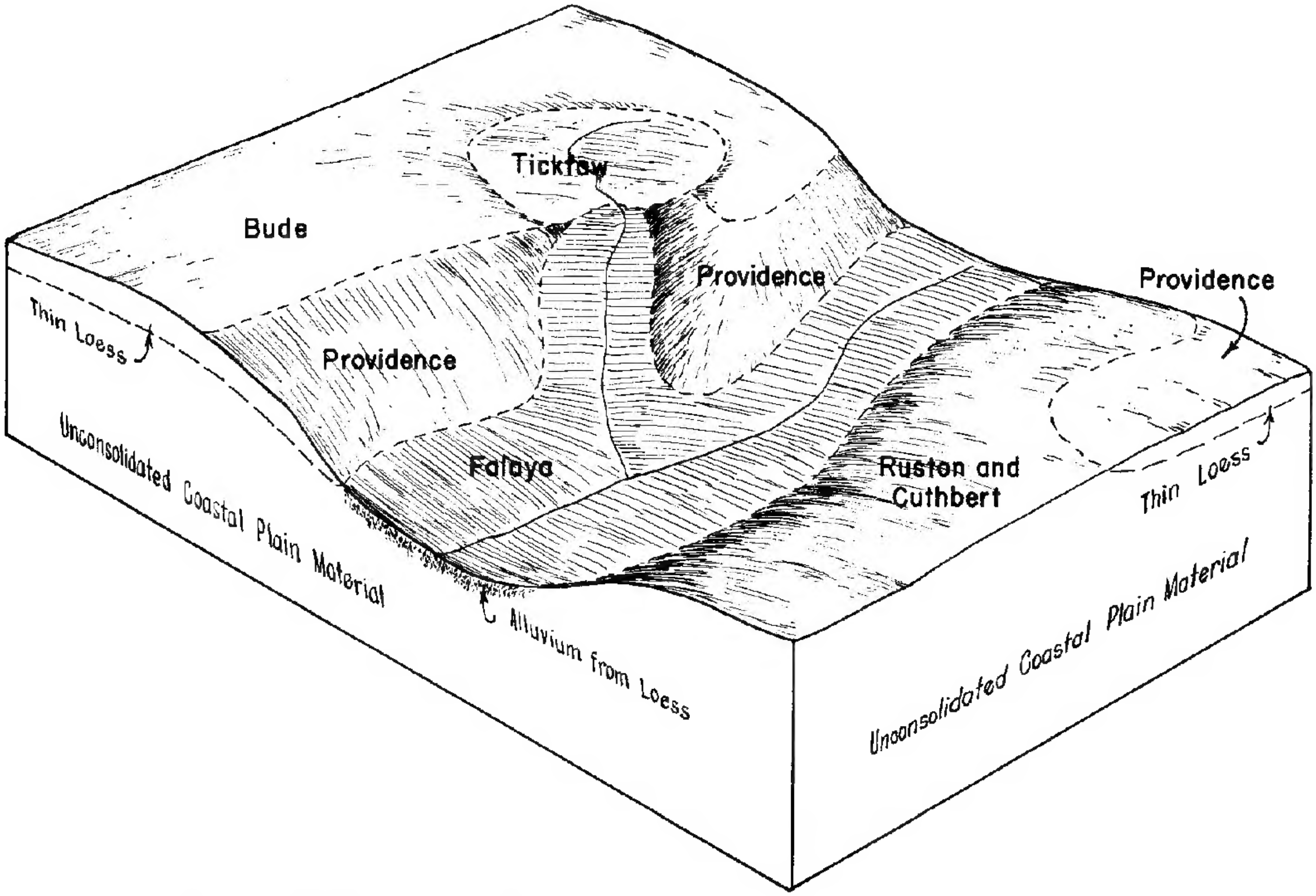

Figure 4.—**Distribution and pattern of major soils in Ruston-Cuthbert-Providence association.**

have a light silty clay loam surface layer and mottled silty clay subsurface layers. Waverly soils occur in broad depressions or in areas near steep bluffs. They are poorly drained. They have a silt loam surface layer and silty clay loam subsurface layers and are grayish throughout their profile. Falaya soils cover about 50 percent of the association, Urbo soils 15 percent, and Waverly soils about 15 percent.

Mixed alluvial land and Chastain, Collins, and Hatchie soils make up less than 20 percent of the association.

Most of this association has been cleared of trees and is now row cropped. The farms ordinarily are of the cash-crop type and are about 100 acres in size. The dominant crops are cotton, corn, and soybeans. Interest in dairying has increased in recent years, and at present there are a number of dairies in the area. Many of the farmers obtain a large part of their income from off-the-farm employment.

The stream bottoms and terraces are well suited to cotton, corn, and soybeans and are moderately productive of these crops. Roads, bridges, fences, and crops are sometimes damaged by flooding.

Descriptions of Soils

This section describes the soil series and mapping units of Tippah County. The approximate acreage and the proportionate extent of each mapping unit are given in table 1.

A general description of each soil series is given, and it is followed by brief descriptions of the mapping units in that series. For full information on any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of the description of each mapping unit are the capability unit and woodland group in which the mapping unit has been placed. The page on which each capability unit and each woodland group is described can be found readily by referring to the "Guide to Mapping Units" at the back of the report.

Soil scientists, engineers, students, and others who want detailed descriptions of soil series should turn to the section "Formation and Classification of Soils." Many

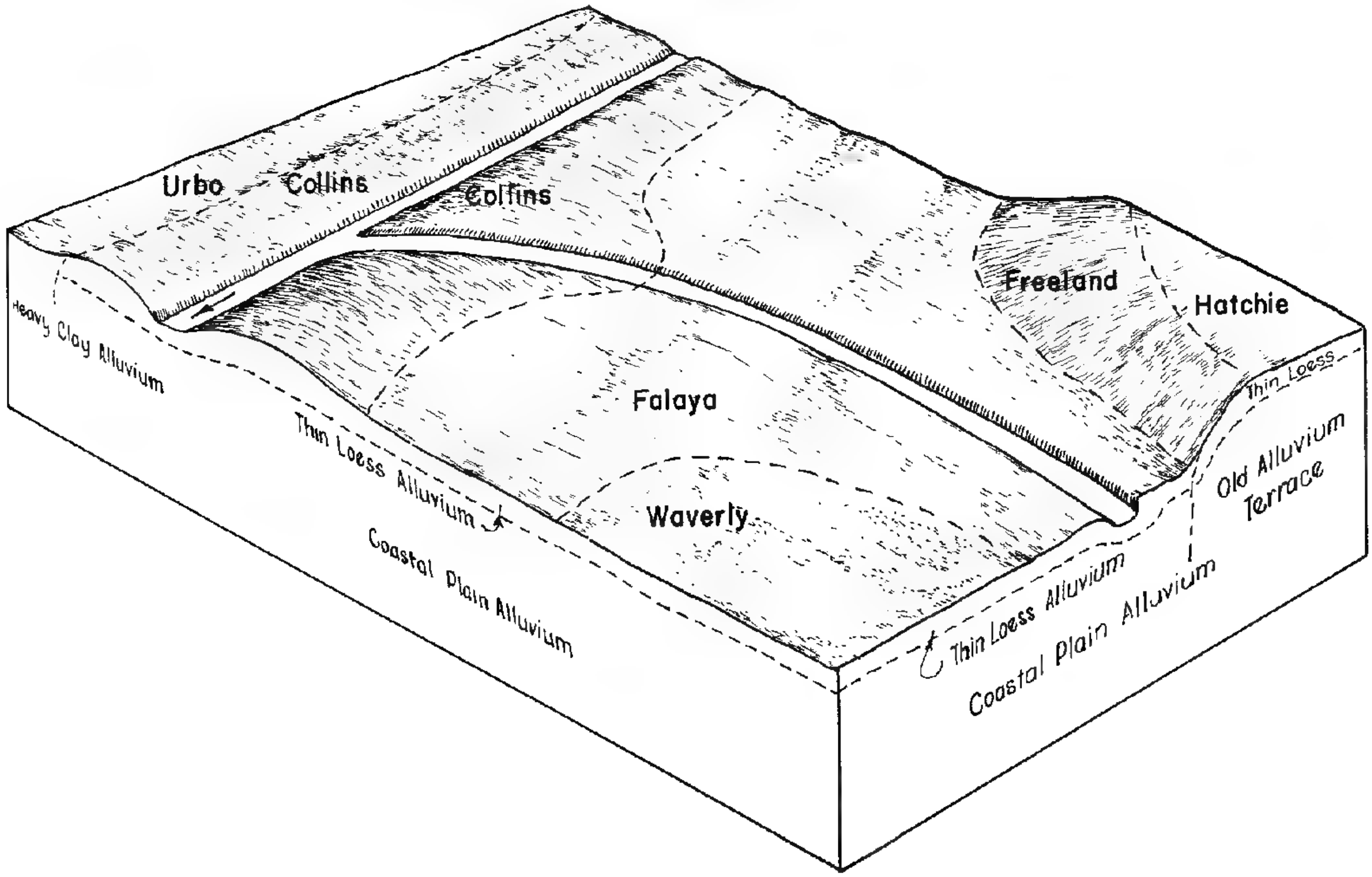

Figure 5.—**Distribution and pattern of major soils in Falaya-Urbo-Waverly association.**

terms used in the soil descriptions and other sections of the report are defined in the Glossary.

Almo Series

Almo soils are poorly drained and have a compact and brittle fragipan about 20 inches beneath the surface. These soils formed in mixed sandy and silty alluvium transported from upland soils that formed in loess and sandy Coastal Plain material. The main layers of a typical profile are—

- 0 to 7 inches, grayish-brown, friable silt loam distinctly mottled with shades of brown.
- 7 to 22 inches, light brownish-gray, friable silt loam distinctly mottled with shades of brown.
- 22 to 28 inches, light brownish-gray, compact and brittle fragipan of silty clay loam texture; distinctly mottled with shades of brown.
- 28 to 60 inches +, grayish-brown, slightly plastic heavy silty clay loam mottled with shades of brown and red.

These soils are on terraces, or second bottoms, throughout the county. They have slopes of less than 2 percent. They are adjacent to Hatchie, Bude, Falkner, and Wilcox soils. They are somewhat similar to Hatchie and Bude soils but are poorly drained rather than somewhat poorly drained. They are grayer in the upper horizons than Wilcox and Falkner soils, and they have a fragipan.

Almo soils are low in natural fertility and slightly acid. They have low or moderate available water capacity and a slow infiltration rate. Permeability is moderate in the upper horizons and slow in the fragipan and underlying material. The organic-matter content is low.

Almo soils are easy to work, but they are likely to crust and pack. A plowpan forms readily. Removal of surface water is needed. This can generally be provided by row arrangement and by means of V-type and W-type field ditches.

Almo silt loam (0 to 2 percent slopes) (Ao).—This is a poorly drained soil on terraces. It has a fragipan. The surface layer is grayish-brown, friable silt loam. The upper part of the subsoil is light brownish-gray, friable silt loam distinctly mottled with shades of brown. At a depth of about 22 inches, there is a compact and brittle fragipan of light brownish-gray silty clay loam distinctly mottled with shades of brown. Below a depth of about 28 inches the subsoil is grayish-brown, slightly plastic heavy silty clay loam mottled with shades of brown and red.

Included in the areas mapped are small areas of Falaya and Waverly soils, which also formed in alluvium, and small areas of better drained Hatchie soils.

This soil is slightly acid, low in organic-matter content, and low in natural fertility. It responds well to applications of both lime and fertilizer. The infiltration rate is slow, and the available water capacity is low. Permeability is moderate in the upper horizons and slow in the fragipan.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Almo silt loam	398	0.1
Atwood silt loam, 2 to 5 percent slopes, eroded	173	.1
Atwood silt loam, 2 to 5 percent slopes, severely eroded	302	.1
Atwood silt loam, 5 to 8 percent slopes, severely eroded	1,987	.7
Atwood silt loam, 8 to 12 percent slopes, severely eroded	417	.1
Bude silt loam, 0 to 2 percent slopes	460	.2
Bude silt loam, 2 to 5 percent slopes	331	.1
Bude silt loam, 2 to 5 percent slopes, eroded	1,474	.5
Chastain soils	2,605	.9
Collins silt loam	1,738	.6
Collins silt loam, local alluvium	279	.1
Dulac silt loam, 2 to 5 percent slopes, eroded	1,006	.3
Dulac silt loam, 2 to 5 percent slopes, severely eroded	1,855	.6
Dulac silt loam, 5 to 8 percent slopes, severely eroded	4,815	1.6
Dulac-Wilcox complex, 8 to 12 percent slopes	2,935	1.0
Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded	4,272	1.4
Falaya silt loam	16,646	5.6
Falaya silt loam, local alluvium	11,096	3.7
Falaya silt loam, overflow	1,739	.6
Falkner silt loam, 0 to 2 percent slopes	265	.1
Falkner silt loam, 2 to 5 percent slopes, eroded	4,048	1.4
Falkner silt loam, 2 to 5 percent slopes, severely eroded	1,475	.5
Falkner silt loam, 5 to 8 percent slopes, eroded	250	.1
Falkner silt loam, 5 to 8 percent slopes, severely eroded	1,210	.4
Freeland silt loam, 2 to 5 percent slopes, eroded	351	.1
Gullied land, clayey	13,804	4.6
Gullied land, sandy	88,913	30.0
Hatchie silt loam, 0 to 2 percent slopes	218	.1
Hatchie silt loam, 2 to 5 percent slopes	1,197	.4
Iuka soils	1,669	.6
Iuka soils, local alluvium	327	.1
Mantachie soils	5,547	1.9
Mantachie soils, local alluvium	369	.1
Mantachie soils, overflow	791	0.3
Mixed alluvial land	3,479	1.2
Mixed alluvial land, overflow	1,543	.5
Ora loam, 2 to 5 percent slopes, severely eroded	576	.2
Ora loam, 5 to 8 percent slopes, severely eroded	4,560	1.5
Ora loam, 8 to 12 percent slopes, severely eroded	2,165	.7
Ora silt loam, 2 to 5 percent slopes, eroded	338	.1
Ora silt loam, 5 to 8 percent slopes, eroded	228	.1
Providence silt loam, 2 to 5 percent slopes, eroded	943	.3
Providence silt loam, 2 to 5 percent slopes, severely eroded	1,214	.4
Providence silt loam, 5 to 8 percent slopes, eroded	230	.1
Providence silt loam, 5 to 8 percent slopes, severely eroded	9,813	3.3
Providence silt loam, 8 to 12 percent slopes, severely eroded	3,614	1.2
Ruston soils, 12 to 17 percent slopes	780	.3
Ruston soils, 12 to 17 percent slopes, eroded	2,422	8
Ruston soils, 17 to 45 percent slopes	24,860	8.4
Ruston-Cuthbert association, moderately steep	1,110	.4
Ruston-Cuthbert association, moderately steep, eroded	2,660	.9
Ruston-Cuthbert association, steep	19,967	6.7
Ruston-Cuthbert-Shubuta association, moderately steep, eroded	947	.3
Ruston-Cuthbert-Shubuta association, steep	13,652	4.6
Tickfaw silt loam	427	.1
Urbo silty clay loam	3,703	1.3
Waverly and Bibb soils	6,363	2.1
Wilcox-Cuthbert association, moderately steep	1,790	.6
Wilcox-Cuthbert association, moderately steep, severely eroded	3,538	1.2
Wilcox-Cuthbert association, steep	8,588	2.9
Wilcox-Cuthbert association, steep, severely eroded	2,488	.8
Total	296,960	100.0

This soil is easy to work, but it crusts and packs readily. If heavily fertilized and otherwise well managed, it is ordinarily fairly productive of most of the crops commonly grown in the area. It is especially well suited to lespedeza. Excess water is a moderate limitation. Drainage can be improved by proper row arrangement and by means of V-type and W-type ditches. *Capability unit IIIw-2; woodland group 5.*

Atwood Series

Atwood soils are well drained. The subsoil is yellowish-red silty clay loam. These soils formed in thin loess and red, friable Coastal Plain material. The main layers of a typical profile are—

- 0 to 6 inches, dark reddish-brown, friable silt loam.
- 6 to 28 inches, yellowish-red, friable silty clay loam.
- 28 to 60 inches +, dark reddish-brown, friable silty clay loam.

These soils have slopes of less than 12 percent. They are on broad, gently sloping ridgetops and strongly sloping upper side slopes in the Pontotoc Ridge section. They are adjacent to and are somewhat similar to Ruston, Ora, Providence, and Dulac soils. They are better drained than Ora, Providence, and Dulac soils, and they lack a fragipan. They are siltier throughout the profile than Ruston soils.

Atwood soils are moderate in natural fertility and strongly acid. They have a deep root zone, are high in available moisture, and respond well to applications of lime and fertilizer. They are well suited to most of the commonly grown row crops, pasture plants, and trees. There is an erosion hazard that must be considered when cropping systems are planned.

Atwood silt loam, 2 to 5 percent slopes, eroded (AtB2).—This is a well-drained upland soil on ridgetops and upper side slopes. The surface layer is dark reddish-brown, friable silt loam. It is about 6 inches thick. The upper part of the subsoil is yellowish red, friable silty clay loam. Below a depth of about 28 inches, the subsoil is dark reddish-brown, friable silty clay loam. Just after a field has been plowed, it is easy to see that part of it, nearly half in some places, has a surface layer consisting of yellowish-red heavy silt loam from the subsoil.

Included in the areas mapped are small areas of Providence and Dulac soils, which have a fragipan, and small areas of sandier Ruston and Ora soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of lime and fertilizer. The infiltration rate is slow, and permeability is moderate. The available moisture capacity is high.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized, it is productive of all of the crops commonly grown in the area. It is especially well suited to peaches. It is also well suited to pasture plants and pine trees. Erosion is a hazard if this soil is cultivated. *Capability unit IIe-1; woodland group 2.*

Atwood silt loam, 2 to 5 percent slopes, severely eroded (AtB3).—This is a well-drained upland soil on ridgetops and upper side slopes. Most of the original surface layer and part of the subsoil have been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is reddish-brown silt loam with small patches that are darker colored. In some spots the yellowish-red subsoil is exposed. There are a few rills and shallow gullies in most fields. The upper part of the subsoil is yellowish-red, friable silty clay loam. Below a depth of about 25 inches, the subsoil is dark reddish-brown, friable silty clay loam.

Included in the areas mapped are small areas of Providence and Dulac soils, which are silty and have a fragipan, and small areas of sandier Ruston and Ora soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of both lime and fertilizer. The infiltration rate is slow, permeability is moderate, and the available water capacity is moderate or high.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is fairly productive of all of the crops commonly grown in the area. It is especially well suited to peaches and also is well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe-1; woodland group 2.*

Atwood silt loam, 5 to 8 percent slopes, severely eroded (AtC3).—This is a well-drained upland soil on long, narrow to broad ridgetops and on upper side slopes. Most of the original surface layer and part of the subsoil have been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is reddish-brown silt loam with small patches that are darker colored. In some spots the yellowish-red subsoil is exposed. The upper part of the subsoil is yellowish-red, friable silty clay loam. Below a depth of about 25 inches, the subsoil is dark reddish-brown, friable silty clay loam. There are a few rills and shallow gullies in most fields.

Included in the areas mapped are small areas of Providence and Dulac soils, which are silty and have a fragipan, and small areas of sandier Ruston and Ora soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of both lime and fertilizer. The infiltration rate is slow, permeability is moderate, and the available water capacity is moderate or high.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is productive of all of the crops commonly grown in the area. It is especially well suited to peaches and also is well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe-1; woodland group 2.*

Atwood silt loam, 8 to 12 percent slopes, severely eroded (AtD3).—This is a well-drained upland soil on upper side slopes. Most of the original surface layer and part of the subsoil have been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is reddish-brown silt loam with small patches that are darker colored. In some spots the yellowish-red subsoil is exposed. The upper part of the subsoil is yellowish-red, friable silty clay loam. Below a depth of about 25 inches, the subsoil is dark reddish-brown, friable silty clay loam. There are a few rills and shallow gullies in most fields.

Included in the areas mapped are small areas of Providence and Dulac soils, which are silty and have a fragipan, and small areas of sandier Ruston and Ora soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of both lime and fertilizer. The infiltration rate is slow, permeability is moderate, and the available water capacity is moderate to high.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is productive of all of the crops commonly grown in the area. It is especially well suited to peaches and also is well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IVe-1; woodland group 2.*

Bibb Series

Bibb soils are grayish, poorly drained, and predominantly coarse textured. They are forming in alluvium.

These soils are in the eastern part of the county, on the flood plains of the Hatchie River and its tributaries. They are adjacent to and are somewhat similar to Mantachie and Chastain soils and Mixed alluvial land. They are more poorly drained than Mantachie soils and Mixed alluvial land. They are coarser textured than Chastain soils, especially in the subsoil.

Bibb soils are strongly acid. They are low in natural fertility and low in organic-matter content. The available water capacity is moderate to low. Permeability and the infiltration rate are moderate.

In Tippah County, Bibb soils are mapped as part of an undifferentiated unit with Waverly soils. The main layers of a typical profile are described under the heading "Waverly and Bibb soils (Wb)."

Bude Series

Bude soils are somewhat poorly drained. Their subsoil is yellowish-brown heavy silt loam, and there is a brittle and compact fragipan at a depth of about 24 inches. These soils formed in thin loess underlain by light-gray, friable Coastal Plain material. The main layers of a typical profile are—

- 0 to 7 inches, dark grayish-brown, friable silt loam faintly mottled with shades of brown.
- 7 to 24 inches, yellowish-brown, slightly plastic heavy silt loam mottled with shades of gray and brown.

24 to 46 inches, light-gray, compact and brittle heavy silt loam distinctly mottled with shades of olive, brown, and gray (fragipan).
46 to 62 inches +, gray, slightly plastic clay loam distinctly mottled with shades of brown and gray.

These soils are on broad, nearly level and gently sloping areas in the Interior Flatwoods. They have slopes of less than 5 percent. They are adjacent to and are somewhat similar to Falkner, Providence, Dulac, and Tickfaw soils. They are less well drained than Providence and Dulac soils. They are underlain by more friable material than are Falkner soils, and they have a fragipan. They are better drained than Tickfaw soils.

Bude soils are moderately fertile and strongly acid. They respond well to applications of lime and fertilizer. The available water capacity is moderate to low. The infiltration rate is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan.

Bude soils are easy to work, but they crust and pack when bare. A plowpan forms readily. These soils are suited to trees, pasture plants, and most of the commonly grown row crops.

Bude silt loam, 0 to 2 percent slopes (BuA).—This is a somewhat poorly drained soil that has a brittle and compact fragipan. It occurs as broad, nearly level areas. The surface layer is dark grayish-brown, friable silt loam. The subsoil, which is at a depth of about 7 inches, is yellowish-brown, slightly plastic silt loam mottled with shades of gray and brown. The fragipan, which is at a depth of about 24 inches, is light-gray heavy silt loam distinctly mottled with shades of olive, brown, and gray. The horizons beneath the fragipan are gray, slightly plastic clay loam mottled with shades of brown and gray.

Included in the areas mapped are small areas of Providence and Dulac soils, which are moderately well drained and have a fragipan; small areas of Tickfaw soils, which are poorly drained; and small areas of Falkner soils, which are poorly drained and lack a fragipan.

This soil is low in organic-matter content, is strongly acid, and is moderate in natural fertility. It responds well to applications of lime and fertilizer. The infiltration rate is slow. Permeability is moderate in the upper subsoil but slow in the fragipan. The available water capacity is moderate to low.

This soil is suited to trees, pasture plants, and most of the commonly grown row crops. It is easy to work, but it crusts and packs readily. A plowpan is likely to form. *Capability unit IIIw-1; woodland group 3.*

Bude silt loam, 2 to 5 percent slopes (BuB).—This is a somewhat poorly drained soil that has a brittle and compact fragipan. It occurs as broad, gently sloping areas. The surface layer is dark grayish-brown, friable silt loam. The subsoil, at a depth of about 7 inches, is yellowish-brown, slightly plastic silt loam mottled with shades of gray and brown. The fragipan, which is about 24 inches below the surface, is light-gray heavy silt loam distinctly mottled with shades of olive, brown, and gray. It overlies mottled gray, slightly plastic clay loam.

Included in the areas mapped are small areas of well drained Atwood soils, moderately well drained Dulac and Providence soils, and poorly drained Tickfaw soils. Also included are small areas of somewhat poorly drained Falkner soils, which have a fragipan.

This soil is low in organic-matter content, is strongly acid, and is moderate in natural fertility. It responds well to applications of lime and fertilizer. The infiltration rate is slow. Permeability is moderate in the upper subsoil but slow in the fragipan. The available water capacity is moderate to low.

This soil is suited to trees, pasture plants, and the commonly grown row crops. If it is cultivated, there is a slight erosion hazard. It is easy to work, but it crusts and packs readily. A plowpan is likely to form. *Capability unit IIIw-1; woodland group 3.*

Bude silt loam, 2 to 5 percent slopes, eroded (BuB2).—This is a somewhat poorly drained soil that has a brittle and compact fragipan. It occurs as broad, gently sloping areas. The surface layer is dark grayish-brown, friable silt loam. In plowed fields there are patches of yellowish-brown heavy silt loam, which was originally part of the subsoil. There are a few rills and shallow gullies in these areas. The subsoil, at a depth of about 7 inches, is yellowish-brown and light-gray, slightly plastic heavy silt loam mottled with shades of gray and brown. The fragipan is light-gray heavy silt loam mottled with shades of brown, olive, and gray. It overlies mottled gray, slightly plastic clay loam.

Included in the areas mapped are small areas of moderately well drained Providence and Dulac soils and poorly drained Tickfaw soils. Also included are small areas of somewhat poorly drained Falkner soils, which have a fragipan.

This soil is low in organic-matter content, is strongly acid, and is moderate in natural fertility. It responds well to applications of lime and fertilizer. The infiltration rate is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The available water capacity is moderate to low.

This soil is suited to trees, pasture plants, and the commonly grown row crops. If it is cultivated, there is a slight erosion hazard. It is easy to work, but it crusts and packs readily. A plowpan is likely to form. *Capability unit IIIw-1; woodland group 3.*

Chastain Series

Chastain soils are poorly drained and have a gleyed, plastic silty clay subsoil. These soils formed in fine-textured Coastal Plain material. The main layers of a typical profile are—

0 to 5 inches, dark-brown, friable heavy silt loam faintly mottled with grayish brown.
5 to 51 inches, grayish-brown, plastic silty clay distinctly mottled with shades of brown and red.
51 to 60 inches +, gleyed, yellowish red, slightly plastic clay loam mottled with shades of brown.

These soils are generally in the slack-water areas on bottom lands throughout the county. They are adjacent to and are somewhat similar to Falaya, Collins, Waverly, Bibb, Urbo, Iuka, and Mantachie soils. They are more poorly drained than Collins and Iuka soils, which are moderately well drained, and Falaya, Urbo, and Mantachie soils, which are somewhat poorly drained. They are finer textured throughout the profile than Waverly and Bibb soils.

Chastain soils are low in natural fertility and very strongly acid. They respond fairly well to fertilization. Permeability and the infiltration rate are slow.

These soils are well suited to most of the commonly grown pasture plants and close-growing crops. They are also suited to hardwood trees. They are poorly suited to most row crops, particularly deep-rooted crops. Excess water, both on the surface and in the soil, is a limitation that must be considered when cropping systems are planned.

Chastain soils (Ch).—These are poorly drained soils on the bottom lands. The surface layer is dark-brown, friable heavy silt loam faintly mottled with grayish brown. It is about 5 inches thick. The underlying horizons are gleyed, grayish-brown, plastic silty clay mottled with shades of brown and red. The layer below a depth of about 51 inches is gleyed, yellowish-red, slightly plastic clay loam mottled with shades of brown.

Included in the areas mapped are small areas of moderately well drained Iuka and Collins soils, somewhat poorly drained Falaya, Urbo, and Mantachie soils, and coarser textured, poorly drained Waverly and Bibb soils.

These soils are strongly acid. They are low in organic-matter content and low in natural fertility. The available water capacity is low to moderate. Permeability and the infiltration rate are slow.

These soils are poorly suited to most row crops, particularly the deep-rooted ones, but they are well suited to most of the commonly grown pasture plants and close-growing crops. They are especially well suited to annual lespedeza. Excess water is a limitation that must be considered when cropping systems are planned. *Capability unit IVw-1; woodland group 8.*

Collins Series

Collins soils are moderately well drained. Their surface layer is brown to dark-brown silt loam. The underlying horizon is dark yellowish brown or yellowish brown. These soils are forming in alluvium washed from loessal soils of the uplands. The main layers of a typical profile are—

- 0 to 6 inches, brown to dark-brown, very friable silt loam.
- 6 to 19 inches, dark yellowish-brown or yellowish-brown, friable silt loam.
- 19 to 42 inches +, brown, dark-brown, or yellowish-brown, friable silt loam distinctly mottled with shades of gray, brown, and red.

These soils occur on the bottom lands in the western part of the county. Generally they are either in the higher lying areas or in or near old channels of Muddy Creek and Tippah Creek and their tributaries. They are adjacent to and are somewhat similar to Falaya and Urbo soils and Mixed alluvial land. They are siltier throughout the profile than Urbo soils. They are better drained than Falaya soils. They differ from Mixed alluvial land in that they are uniformly silty instead of having many strata of sand.

Collins soils are very strongly acid. The natural fertility is moderate, and the organic-matter content is low. The available water capacity is high, the infiltration rate is slow, and permeability is slow to moderate.

Collins soils are well suited to almost all of the commonly grown crops, pasture plants, and trees. Excess surface water is a limitation that must be considered when cropping systems are planned. If drained, these soils are especially well suited to cotton and corn.

Collins silt loam (Cn).—This is a moderately well drained silty soil on the bottom lands in the western part of the county. The surface layer is brown or dark-brown, very friable silt loam. The subsurface layer is dark yellowish-brown, friable silt loam. The layer below a depth of about 19 inches is brown or dark-brown, friable silt loam distinctly mottled with shades of gray, brown, and red.

Included in the areas mapped are small areas of moderately well drained sandy Iuka soils, somewhat poorly drained Falaya, Mantachie, and Urbo soils, and poorly drained Waverly, Bibb, and Chastain soils.

This soil is moderately fertile and very strongly acid. The organic-matter content is low. The available water capacity is moderate to high, the infiltration rate is slow, and permeability is slow to moderate.

This soil is easy to work. It is suited to almost all of the commonly grown crops, pasture plants, and trees. Plowpans and traffic pans form readily, however, and excess water is a limitation that must be considered when cropping systems are planned. If drained, this soil is one of the most productive soils in the county and is especially well suited to cotton and corn. *Capability unit IIw-2; woodland group 6.*

Collins silt loam, local alluvium (Co).—This is a moderately well drained, silty soil on the bottom lands in the western part of the county. It occurs at the base of slopes or in the narrow bottoms of tributaries and is generally at a higher elevation than the bottom lands along the nearby major streams. The surface layer is brown or dark-brown, very friable silt loam, and the subsurface layer is dark yellowish-brown, friable silt loam. The layer below a depth of about 19 inches is brown or dark-brown silt loam distinctly mottled with shades of gray, brown, and red. Ordinarily this soil is not subject to as much flooding as is Collins silt loam.

Included in the areas mapped are small areas of moderately well drained sandy Iuka soils, somewhat poorly drained Falaya, Mantachie, and Urbo soils, and poorly drained Waverly, Bibb, and Chastain soils.

This soil is moderately fertile and very strongly acid. The organic matter content is low. The available water capacity is moderate to high, the infiltration rate is slow, and permeability is slow to moderate.

This soil is easy to work and is well suited to almost all of the commonly grown crops, pasture plants, and trees. Plowpans and traffic pans form readily, however, and excess water is a hazard that must be considered when cropping systems are planned. If drained, this soil is one of the most productive soils in the county and is especially well suited to cotton and corn. *Capability unit IIw-2; woodland group 6.*

Cuthbert Series

Cuthbert soils are moderately well drained, acid soils of the uplands. They formed in fine-textured, stratified Coastal Plain material.

These soils occur throughout the county on side slopes of more than 12 percent. They are adjacent to and similar to Shubuta, Ruston, Wilcox, Dulac, Providence, and Ora soils. They have a finer textured subsoil than the Ruston, Dulac, Providence, or Ora soils. They have mottles and stratified material nearer the surface than

do Shubuta soils. They differ from Wilcox soils in that they are underlain by stratified, predominantly heavy material.

Cuthbert soils are strongly acid, low in organic-matter content, and low in natural fertility. The root zone is moderately deep. The infiltration rate and permeability are slow. The available water capacity is moderate.

The native vegetation consists of hardwood and pine trees and an understory of native grasses and shrubs. Because of the steep slopes, these soils are not suited to row crops. Most of the acreage is used for tree crops. If these soils are well managed, the smoother slopes can be used for pasture.

In Tippah County, Cuthbert soils are mapped with other soils, as part of soil associations. The main layers in a typical profile of a Cuthbert soil are described under the heading "Ruston-Cuthbert association, moderately steep (RsE)."

Dulac Series

Dulac soils are moderately well drained and have a brittle and compact fragipan. They formed in thin loess and red, fine-textured Coastal Plain material. The main layers of a typical profile are—

- 0 to 5 inches, dark-brown, very friable silt loam.
- 5 to 23 inches, brown or dark-brown, friable silty clay loam.
- 23 to 38 inches, brown or dark-brown, compact and brittle silt loam distinctly mottled with shades of brown, gray, and red (fragipan).
- 38 to 60 inches +, dark-red, very plastic clay distinctly mottled with shades of gray.

These soils occur on broad, gently sloping ridgetops and on strongly sloping upper side slopes in the western two-thirds of the county. They have slopes of less than 12 percent. They are adjacent to and are somewhat similar to Ruston, Falkner, Providence, and Atwood soils. Their fragipan is more clayey and less sandy than that in Providence soils, and the underlying material is finer textured. They are less sandy than Ruston soils, which lack a fragipan. Atwood and Falkner soils also lack a fragipan.

Dulac soils are strongly acid. They are moderate in natural fertility and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and in the clay layer.

For the most part, Dulac soils have been cleared of trees and are now in row crops and in pasture. If well managed, they are productive of all crops commonly grown in the county. There is an erosion hazard that must be considered when cropping systems are planned.

Dulac silt loam, 2 to 5 percent slopes, eroded (DuB2).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It consists predominantly of dark-brown silt loam but includes scattered patches of ligher brown, finer textured material, which was part of the original subsoil. There are a few rills and shallow gullies in these areas. The upper part of the subsoil is brown or dark-brown, friable silty clay loam. The fragipan, which is at a depth of about 23 inches, is brown or dark-brown silt loam distinctly mottled with shades of brown, gray, and red. Below a depth of about 38 inches, the material is mottled dark-red, very plastic clay.

Included in the areas mapped are small areas of sandier Ruston and Ora soils; small areas of silty Atwood and Falkner soils, which lack a fragipan; and small areas of silty Providence soils, which have a fragipan and overlie friable sandy material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and in the clay layer. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is fairly productive of all crops commonly grown in the area (fig. 6). It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIe-2; woodland group 2.*

Dulac silt loam, 2 to 5 percent slopes, severely eroded (DuB3).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present plow layer is predominantly strong-brown heavy silt loam but includes scattered patches of the original dark-brown surface layer. Rills and shallow gullies are common, and there are a few deep gullies. Also included are small areas where the surface texture is silty clay loam. The upper part of the subsoil is brown or dark-brown, friable silty clay loam. The fragipan, which is at a depth of about 20 inches, is brown or dark-brown silt loam mottled with shades of brown, gray, and red. Below a depth of about 35 inches, the material is mottled dark-red, very plastic clay.

Included in the areas mapped are small areas of sandier Ruston and Ora soils; small areas of silty Atwood and Falkner soils, which lack a fragipan; and small areas of silty Providence soils, which have a fragipan and overlie friable sandy material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The infiltration rate

Figure 6.—**Dulac silt loam, 2 to 5 percent slopes, eroded, planted to cotton.**

is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and clay layer. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe–2; woodland group 2.*

Dulac silt loam, 5 to 8 percent slopes, severely eroded (DuC3).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present surface layer is predominantly strong-brown heavy silt loam but includes scattered patches of the original dark-brown surface layer. Rills and shallow gullies are common, and there are a few deep gullies. Also included are small areas where the texture of the surface layer is silty clay loam. The upper part of the subsoil is brown or dark-brown, friable silty clay loam. The fragipan, which is at a depth of about 20 inches, is brown or dark-brown silt loam mottled with shades of brown, gray, and red. Below a depth of about 35 inches, the material is mottled dark-red, very plastic clay.

Included in the areas mapped are small areas of sandier Ruston and Ora soils; small areas of silty Atwood and Falkner soils, which lack a fragipan; and small areas of silty Providence soils, which have a fragipan and overlie friable sandy material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and in the clay layer. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. The erosion hazard is severe if row crops are grown. *Capability unit IVe–2; woodland group 2.*

Dulac-Wilcox complex, 8 to 12 percent slopes (DwD).—This complex consists of moderately well drained Dulac soils and somewhat poorly drained Wilcox soils, generally in about the same pattern and proportion. Dulac soils are on the ridges and upper side slopes and cover about 56 percent of the acreage. The middle and lower parts of the slopes are occupied almost entirely by Wilcox soils. Included in the areas mapped are small areas of silty Falkner soils, which lack a fragipan; and small areas of silty Providence and Bude soils, which have a fragipan.

Dulac soils are moderately well drained, acid upland soils that have a fragipan. They formed in thin loess and overlying fine-textured Coastal Plain material. The main layers of a typical profile are —

0 to 5 inches, dark-brown, very friable silt loam.
5 to 23 inches, brown or dark-brown, friable silty clay loam.
23 to 38 inches, brown or dark-brown, compact and brittle silt loam distinctly mottled with shades of brown, gray, and red.
38 to 60 inches +, dark-red, very plastic clay distinctly mottled with shades of gray.

The Wilcox soils in this complex formed in beds of acid, Coastal Plain clay shales. They are described under the heading "Wilcox Series." The main layers of a typical profile are—

0 to 6 inches, dark brown, friable silt loam.
6 to 30 inches, yellowish-red, plastic clay distinctly mottled with shades of gray and brown; lower part is light brownish gray mottled with shades of brown and red.
30 to 40 inches +, gray, partially weathered clay shale.

The soils in this complex are acid. The organic-matter content is low, and natural fertility is moderate to low. The infiltration rate is slow. In Dulac soils, permeability is moderate in the upper subsoil but low in the fragipan and clay layer. In Wilcox soils it is slow throughout the profile. The available water capacity is moderate to high.

These soils are best suited to pasture and trees. Pastures respond well to applications of lime and fertilizer, but they yield little forage during dry periods because the soils tend to be droughty. *Dulac soils: Subclass IVe (no unit classification); woodland group 9. Wilcox soils: Subclass VIIe (no unit classification); woodland group 9.*

Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded (DwD3).—This complex consists of severely eroded, moderately well drained Dulac soils and severely eroded, somewhat poorly drained Wilcox soils, generally in about the same pattern and proportion. Dulac soils are on the ridges and upper side slopes and cover about 56 percent of the area. The middle and lower parts of the slopes are nearly all Wilcox soils. There are also small inclusions of Providence, Falkner, and Bude soils in this complex.

Dulac soils are moderately well drained, acid upland soils that have a fragipan. Practically all of the original surface soil has been removed by erosion, and the surface layer now consists predominantly of strong-brown silty clay loam from the subsoil but includes scattered patches of the original surface layer of dark-brown silt loam. A mottled, compact and brittle fragipan of silt loam texture is at a depth of about 17 inches. Below the fragipan, there is a mottled, very plastic clay horizon.

The Wilcox soils in this complex are somewhat poorly drained. Practically all of the original surface layer has been removed by erosion. The present surface layer consists predominantly of mottled clayey material from the subsoil but includes scattered patches of the original surface layer of dark-brown silt loam. The subsoil is distinctly mottled and clayey and grades into partly weathered Porters Creek gray clay shale. Depth to the clay shale ranges from 0 to about 24 inches. In a few areas, severe erosion has exposed this formation.

Both Dulac soils and Wilcox soils are low in natural fertility and low in organic-matter content. Infiltration is slow, and permeability is slow. The available water capacity is moderate to high.

Erosion has been severe on both the Dulac and the Wilcox soils in this complex. The original surface layer has been removed, and there are rills, shallow gullies, and a few deep gullies. The erosion hazard is severe also, and it is not practical to grow row crops. These soils are suited to pasture plants and pine trees. *Dulac soils: Subclass IVe (no unit classification); woodland group 9. Wilcox soils: Subclass VIIe (no unit classification); woodland group 9.*

Falaya Series

Falaya soils are somewhat poorly drained. The surface layer and subsurface layer are dark-brown, friable silt loam. These soils are forming in acid alluvium washed from loessal soils of the uplands. The main layers of a typical profile are—

0 to 11 inches, dark brown, very friable silt loam.
11 to 27 inches, grayish-brown to light brownish gray, friable silt loam mottled with shades of gray and brown.
27 to 55 inches +, gray, friable heavy silt loam distinctly mottled with shades of brown.

These soils are predominant on the bottom lands of Muddy Creek and Tippah Creek and their tributaries, and on other bottom lands in the western two-thirds of the county. They are adjacent to and are somewhat similar to Collins, Waverly, Bibb, Urbo, Chastain, Iuka, and Mantachie soils. They are siltier throughout the profile than Iuka, Mantachie, and Bibb soils. They have more silt and less clay, particularly in the subsurface layers, than do Urbo and Chastain soils. They are more poorly drained than Collins soils, and they are better drained than Waverly soils.

Falaya soils are strongly acid. The natural fertility is moderate, and the organic-matter content is low. The available water capacity is moderate, the infiltration rate is slow, and permeability is slow to moderate.

Falaya soils are well suited to almost all of the commonly grown crops, pasture plants, and trees. If drained, these soils are especially well suited to cotton and corn.

Falaya silt loam (Fa).—This is a somewhat poorly drained, silty, acid soil on the bottom lands in the western two-thirds of the county. The surface layer is dark-brown, very friable silt loam. The subsurface layer, which begins at a depth of 11 inches, is grayish-brown to light brownish-gray, friable silt loam mottled with shades of gray and brown. The layers below a depth of 27 inches are gray, friable heavy silt loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of sandy Iuka, Mantachie, and Bibb soils, heavy-textured Urbo and Chastain soils, moderately well drained Collins soils, and poorly drained Waverly soils.

This soil is moderate in natural fertility and strongly acid. The organic-matter content is low. The available water capacity is moderate, the infiltration rate is slow, and permeability is slow to moderate.

This soil is well suited to almost all of the commonly grown crops, pasture plants, and trees. Excess water, both on the surface and in the soil, is a limitation that must be considered when cropping systems are planned. If drained, this soil is especially well suited to cotton and corn. *Capability unit IIw-3; woodland group 6.*

Falaya silt loam, local alluvium (Fc).—This is a somewhat poorly drained, silty, acid soil on the bottom lands in the western two-thirds of the county. It is forming in alluvium washed from adjacent upland slopes and deposited on the bottom lands of the smaller streams and at the base of hills. It is not often flooded, but it does receive sediments from the surrounding areas. Much of the alluvial material is not well consolidated, and the soil profiles are likely to vary considerably. The surface layer is ordinarily dark-brown, very friable silt loam. The subsurface layer, which begins at a depth of 11 inches, is grayish-brown to light brownish-gray, friable silt loam mottled with shades of gray and brown. The layers below a depth of 27 inches are gray, friable heavy silt loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of sandy Iuka, Mantachie, and Bibb soils, medium-textured Urbo and Chastain soils, moderately well drained Collins soils, and poorly drained Waverly soils.

This soil is moderately fertile and strongly acid. The organic-matter content is low. The available water capacity is moderate, the infiltration rate is slow, and permeability is slow to moderate.

Most of this soil has been cleared. It is well suited to almost all of the commonly grown crops, pasture plants, and trees, but the areas are small. *Capability unit IIw-3; woodland group 6.*

Falaya silt loam, overflow (Ff). This is a somewhat poorly drained, silty, acid soil of the bottom lands. It occurs along the west branch of the Hatchie River and its tributaries and is subject to very severe damage from flooding. The surface layer is dark-brown, very friable silt loam. The subsurface layer, which is below a depth of about 11 inches, is grayish-brown to light brownish-gray, friable silt loam mottled with shades of gray and brown. The layers below a depth of 27 inches are gray, friable heavy silt loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of sandy Iuka, Mantachie, and Bibb soils, medium-textured Urbo and Chastain soils, moderately well drained Collins soils, and poorly drained Waverly soils.

This soil is moderately fertile and strongly acid. The organic-matter content is low. The available water capacity is moderate, the infiltration rate is slow, and permeability is slow to moderate.

Because of the very severe damage from flooding, this soil is best suited to trees. Most of it is wooded or is used as summer pasture. If protected from flooding, this soil is well suited to most of the commonly grown crops and is especially well suited to cotton and corn. *Capability unit Vw-1; woodland group 6.*

Falkner Series

Falkner soils are somewhat poorly drained. The subsoil is yellowish brown silty clay loam. These soils formed in thin loess and gray, fine-textured, acid Coastal Plain material. The main layers of a typical profile are—

0 to 6 inches, yellowish-brown, friable silt loam.
6 to 12 inches, yellowish-brown, friable silty clay loam.
12 to 18 inches, yellowish-brown heavy silt loam distinctly mottled with shades of gray and red.
18 to 61 inches +, gray, very plastic clay distinctly mottled with shades of red and brown. The upper part is plastic silty clay loam.

These soils occupy broad, nearly level to sloping areas in the Interior Flatwoods, chiefly in the western part of the county. They have slopes of less than 8 percent. They are adjacent to and are somewhat similar to Tickfaw, Dulac, Bude, and Providence soils. They are more poorly drained than Dulac and Providence soils, and they lack a fragipan. They are better drained than

Tickfaw soils. They differ from Bude soils in that they lack a fragipan and overlie finer textured material.

Falkner soils are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond to fertilization. The root zone is shallow. The available water capacity is moderate to low, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and in the clay layer.

For the most part, these soils have been cleared of trees and are now in row crops or pasture. They are suited to most of the commonly grown crops, pasture plants, and trees. Where the slope is more than 5 percent, there is an erosion hazard that must be considered when cropping systems are planned.

Falkner silt loam, 0 to 2 percent slopes (FkA).—This is a somewhat poorly drained upland soil in broad, nearly level areas. The surface layer is yellowish-brown, friable silt loam. The upper part of the subsoil is yellowish-brown, friable silty clay loam. At a depth of about 18 inches, the subsoil is plastic silty clay loam. The underlying horizons are gray, very plastic clay distinctly mottled with shades of red and brown.

Included in the areas mapped are small areas of Bude, Dulac, and Providence soils, which are silty and have a fragipan, and small areas of poorly drained Tickfaw soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of both lime and fertilizer. Permeability is moderate in the upper part of the subsoil and slow in the clay layer. The infiltration rate is slow, and the available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. Field ditches and properly arranged rows are needed for disposal of excess surface water. If adequately fertilized and otherwise well managed, this soil is suited to and is fairly productive of all crops commonly grown in the area. *Capability unit IIIw-1; woodland group 3.*

Falkner silt loam, 2 to 5 percent slopes, eroded (FkB2).—This is a somewhat poorly drained upland soil in broad, gently sloping areas. The surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is predominantly yellowish-brown, friable silt loam. Patches of silty clay loam turned up from the subsoil by plowing make up about 20 percent of most areas. There are scattered rills and shallow gullies and a few deep gullies. The upper part of the subsoil is generally yellowish-brown, friable silty clay loam mottled with shades of gray and red. The lower layers are gray, very plastic clay distinctly mottled with shades of red and brown.

Included in the areas mapped are small areas of Bude, Dulac, and Providence soils, which are silty and have a fragipan, and small areas of poorly drained Tickfaw soils.

This soil is strongly acid, low in organic-matter content, and moderate in natural fertility. It responds well to applications of both lime and fertilizer. Permeability is moderate in the upper part of the subsoil and slow in the clay layer. The infiltration rate is slow, and the available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is suited to and is fairly productive of all crops commonly grown in the area. Field ditches and properly arranged rows are needed for disposal of excess surface water. *Capability unit IIIw-1; woodland group 3.*

Falkner silt loam, 2 to 5 percent slopes, severely eroded (FkB3)—This is a somewhat poorly drained upland soil in broad, gently sloping areas. Most of the original surface layer has been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil is predominantly yellowish-brown, friable silt loam but includes small patches that are dark brown. In spots the subsoil is exposed. There are a few rills and shallow gullies and a few deep gullies in most fields. The upper part of the subsoil is yellowish-brown, friable silty clay loam; the lower part is yellowish-brown heavy silt loam distinctly mottled with shades of gray and red. The lower layers are gray, very plastic clay distinctly mottled with shades of red and brown.

Included in the areas mapped are small areas of Bude, Dulac, and Providence soils, which are silty and have a fragipan.

This soil is strongly acid and is low in organic-matter content. It responds well to applications of both lime and fertilizer. Permeability is moderate in the upper part of the subsoil and slow in the clay layers. The infiltration rate is slow, and the available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is suited to and is fairly productive of all crops commonly grown in the area. Because of erosion, however, it is best suited to pasture plants and trees. *Capability unit IVe-3; woodland group 3.*

Falkner silt loam, 5 to 8 percent slopes, eroded (FkC2)—This is a somewhat poorly drained upland soil. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is predominantly yellowish brown, friable silt loam. Patches of yellowish-brown silty clay loam turned up from the subsoil by plowing make up about 20 percent of most areas. There are scattered rills and shallow gullies and a few deep gullies.

The upper part of the subsoil is yellowish-brown, friable silty clay loam; the lower part is yellowish-brown heavy silt loam mottled with shades of gray and red. The lower layers are gray, very plastic clay distinctly mottled with shades of red and brown.

Included in the areas mapped are small areas of Bude, Dulac, and Providence soils, which are silty and have a fragipan.

This soil is strongly acid and is low in organic-matter content. It responds well to applications of both lime and fertilizer. Permeability is moderate in the upper part of the subsoil and slow in the clay layer. The infiltration rate is slow, and the available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. There is an erosion hazard if row crops are grown. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. It is

well suited to pasture plants and pine trees. *Capability unit IIIe-3; woodland group 3.*

Falkner silt loam, 5 to 8 percent slopes, severely eroded (FkC3).—This is a somewhat poorly drained upland soil in broad sloping areas. Most of the original surface layer has been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is predominantly yellowish-brown, friable silt loam but includes small patches that are dark brown. In spots the subsoil is exposed. There are a few rills and shallow gullies and a few deep gullies in most fields. The upper part of the subsoil is yellowish-brown, friable silty clay loam; the lower part is yellowish-brown heavy silt loam distinctly mottled with shades of gray and red. The lower layers are gray, very plastic clay distinctly mottled with shades of red and brown.

Included in the areas mapped are small areas of Bude, Dulac, and Providence soils, which are silty and have a fragipan.

This soil is strongly acid and is low in organic-matter content. It responds well to applications of both lime and fertilizer. Permeability is moderate in the upper part of the subsoil and slow in the clay layers. The infiltration rate is slow, and the available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is suited to and is fairly productive of all crops commonly grown in the area. Because of the slope and erosion, however, it is best suited to pasture plants and trees. *Capability unit IVe-3; woodland group 3.*

Freeland Series

Freeland soils are moderately well drained, brown silty soils that have a weakly compacted and brittle fragipan. These soils formed in mixed or thinly bedded old sandy and silty alluvium transported from upland soils that formed in loess and sandy Coastal Plain material. The main layers of a typical profile are—

- 0 to 7 inches, dark-brown, very friable silt loam.
- 7 to 27 inches, brown, friable silt loam.
- 27 to 40 inches, weakly compacted and brittle fragipan of brown silt loam faintly mottled with shades of gray.
- 40 to 56 inches +, strong-brown, firm loam distinctly mottled with shades of gray.

These gently sloping soils occur on terraces throughout the county. They have slopes of 2 to 5 percent. They are adjacent to Hatchie, Iuka, Falaya, Mantachie, Bibb, Waverly, and Chastain soils. They are somewhat similar to Hatchie soils, which are on terraces also, but they are better drained. Iuka, Falaya, Mantachie, Bibb, Waverly, and Chastain soils are on the flood plains.

Freeland soils are moderate to low in natural fertility, low in organic-matter content, and strongly acid. The root zone is moderately deep. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the profile and slow in the fragipan.

Freeland soils are easy to work, but they are likely to crust and pack. A plowpan forms readily. For the most part, these soils have been cleared and are now in row crops. If well managed, they are productive of all crops commonly grown in the county. There is an erosion hazard, which must be considered when cropping systems are planned.

Freeland silt loam, 2 to 5 percent slopes, eroded (FrB2).—This is a moderately well drained soil on terraces. It has a weakly compacted and brittle fragipan. The surface layer is dark-brown, friable silt loam and is 7 inches thick. In a field that has just been plowed, there are scattered patches where the lighter brown subsoil is exposed. The upper part of the subsoil is brown, friable silt loam. The fragipan, which is at a depth of about 27 inches, is brown silt loam faintly mottled with shades of gray. Below a depth of about 40 inches, the subsoil is strong-brown, firm loam distinctly mottled with shades of gray.

Included in the areas mapped are small areas of Collins, Iuka, Falaya, and Mantachie soils, which are forming in alluvium; and small areas of Hatchie soils, which are on terraces and are more poorly drained than Freeland soils.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. There is an erosion hazard if row crops are grown. If adequately fertilized and otherwise well managed, this soil is productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. *Capability unit IIe-2; woodland group 2.*

Gullied Land

Gullied land occurs throughout the county. It consists of upland soils so severely damaged by erosion that reclamation for row crops and pasture is not economically practical. A large part of the surface layer and much of the subsoil have been lost, and there are many gullies not crossable by farm machinery. The slope range is 5 to 45 percent.

The soil material is generally acid. The texture ranges from clay to sand. The natural fertility is low. Permeability and the infiltration rate vary. The available water capacity is low to moderate. Runoff is generally rapid.

Gullied land is best suited to pine trees.

Gullied land, clayey (5 to 45 percent slopes) (Gc).—This land type consists of Dulac, Wilcox, Falkner, and Cuthbert soils so severely damaged by erosion that reclamation and use for row crops and pasture are generally not economically practical. Nearly all of the surface layer and much of the subsoil have been washed away, and an intricate pattern of gullies has formed.

The soil material is generally acid. The texture ranges from silt to clay. The natural fertility is low to moderate. Permeability is generally slow. The available water capacity is low to moderate. The infiltration rate is generally slow, and runoff is rapid or very rapid; consequently, the erosion hazard is severe. Because of the fine texture, large amounts of the soil material washed from these gullies remains suspended in the water and is

carried into the streams. The damage caused by sedimentation on the flood plains is usually slight.

Perennial vegetation provides protection from further erosion. Both loblolly pine and shortleaf pine are suited to this land type. Loblolly pine is the better suited, because it grows more rapidly and provides a larger amount of cover from needle fall. If well managed, this land type can be stabilized. Good yields of pulpwood and sawlogs can be obtained. *Capability unit VIIe–2; woodland group 12.*

Gullied land, sandy (5 to 45 percent slopes) (Gn).—This land type consists of Atwood, Providence, Ora, and Ruston soils so severely damaged by erosion that reclamation and use for row crops and pasture are generally not economically practical. The surface layer and much of the subsoil have been washed away. The underlying sandy material is exposed, and an intricate pattern of gullies has formed.

The soil material is very strongly acid. The natural fertility is generally low. Permeability is variable. The available water capacity is moderate to low. The infiltration rate is generally moderate, but the steepness of the slopes causes runoff to be rapid or very rapid. The erosion hazard is severe. Because of the coarse texture and the high dispersion rate of the underlying material in the gullies, large amounts of sand washed from these gullies are temporarily suspended in floodwater and are deposited over the flood plains (fig. 7). The damage caused by sedimentation on the flood plains is sometimes very severe. Also, the clogging of channels by sediments from the sandy gullies increases the flood hazard.

Perennial vegetation provides protection from further erosion. Both loblolly pine and shortleaf pine are suited to this land type. Loblolly pine is more suitable because it grows more rapidly and provides a larger amount of cover from needle fall. If well managed, this land type can be stabilized. Good yields of pulpwood and sawlogs can be obtained. *Capability unit VIIe–2; woodland group 12.*

Hatchie Series

Hatchie soils are somewhat poorly drained, acid soils that have a compact and brittle fragipan. These soils formed in mixed sandy and silty alluvium transported from upland soils that formed in loess and sandy Coastal Plain material. The main layers of a typical profile are—

0 to 6 inches, dark-brown, very friable silt loam mottled with shades of lighter brown.

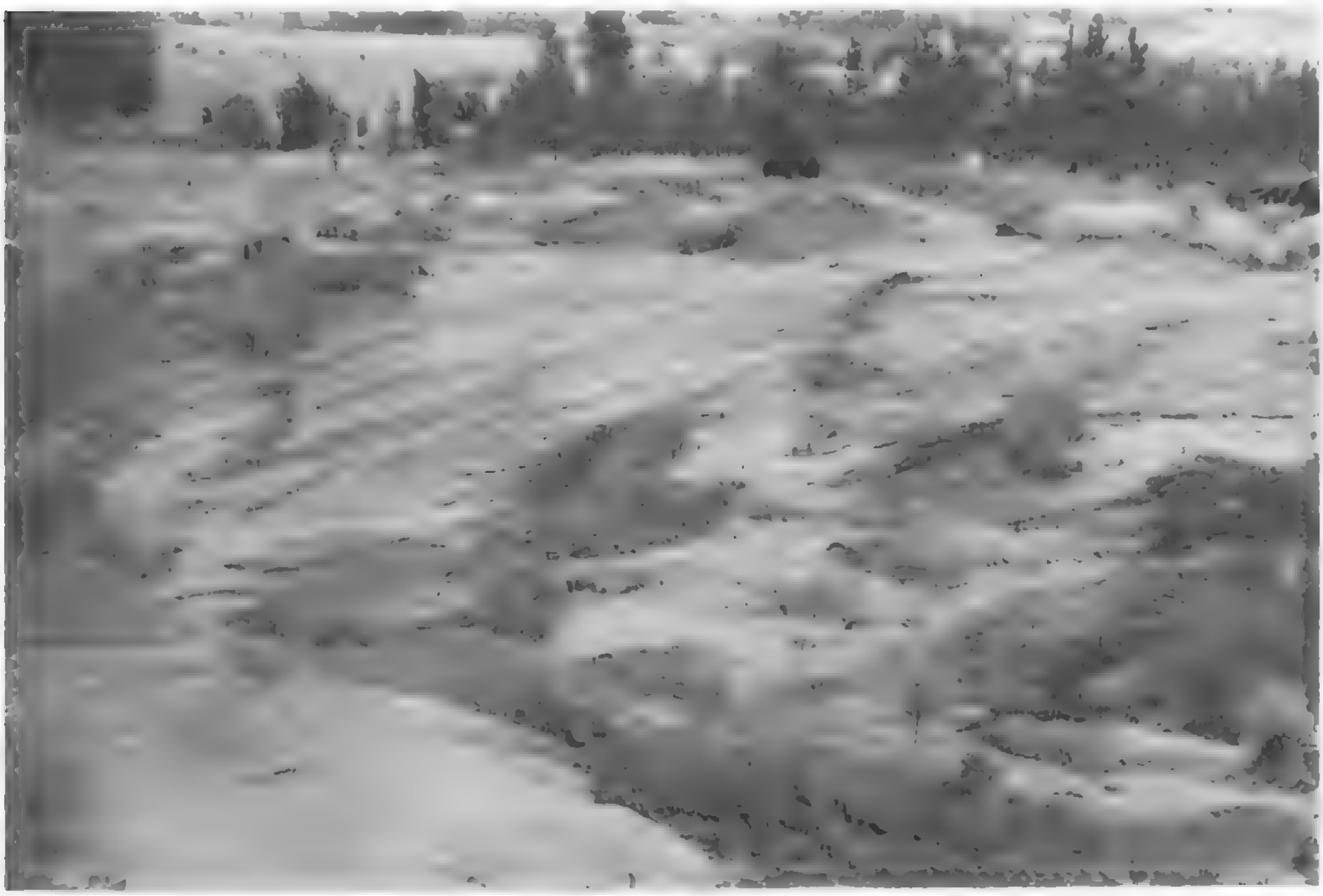

Figure 7.—Gullied land, sandy, just after a severe rainstorm.

6 to 19 inches, yellowish-brown, friable silt loam mottled with shades of gray and yellow in lower part.
19 to 31 inches, compact and brittle fragipan of gray silt loam distinctly mottled with shades of brown and yellow.
31 to 44 inches +, gray, compact and brittle silt loam mottled with shades of brown.

These nearly level or gently sloping soils (slope range, 0 to 5 percent) occur on terraces throughout the county. They are adjacent to Freeland, Almo, Iuka, Falaya, Mantachie, Bibb, Waverly, and Chastain soils. They are similar to Freeland and Almo soils, which are on terraces also, but they are more poorly drained than Freeland soils and are better drained than Almo soils. Iuka, Falaya, Mantachie, Bibb, Waverly, and Chastain soils are on the flood plains.

Hatchie soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The root zone is shallow. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the profile and slow in the fragipan.

Hatchie soils are easy to work, but they crust and pack readily. A plowpan is likely to form. Most of the acreage has been cleared and is now in pasture and row crops. If well managed, these soils are fairly productive of all crops commonly grown in the county.

Hatchie silt loam, 0 to 2 percent slopes (HaA).—This is a somewhat poorly drained, acid soil on terraces. It has a compact and brittle fragipan. The surface layer is 6 inches thick. It is dark-brown, very friable silt loam mottled with shades of lighter brown. The upper part of the subsoil is yellowish brown, friable silt loam; the lower part is mottled with shades of gray and yellow. The fragipan, which is at a depth of about 19 inches, is gray silt loam distinctly mottled with shades of brown and yellow. Below a depth of 31 inches, the subsoil is compact and brittle, gray silt loam mottled with shades of brown.

Included in the areas mapped are small areas of Collins, Iuka, Falaya, and Mantachie soils, which are forming in alluvium; small areas of Almo soils, which are poorly drained soils on terraces; and small areas of Freeland soils, which are moderately well drained soils on terraces.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. Excess water is a moderate limitation. Properly arranged rows and V-type and W-type field ditches can be used to remove water. *Capability unit IIIw-1; woodland group 3.*

Hatchie silt loam, 2 to 5 percent slopes (HaB).—This is a somewhat poorly drained, acid soil on terraces. It has a compact and brittle fragipan. The surface layer is 6 inches thick. It is dark-brown, very friable silt loam mottled with shades of lighter brown. The upper part of the subsoil is yellowish-brown, friable silt loam; the lower part is mottled with shades of gray and yellow. The fragipan is gray silt loam distinctly mottled with shades of brown and yellow and is at a depth of about 19 inches. Below a depth of 31 inches, the subsoil is gray, compact and brittle silt loam mottled with shades of brown.

Included in the areas mapped are small areas of Collins, Iuka, Falaya, and Mantachie soils, which are forming in alluvium; small areas of Almo soils, which are poorly drained soils on terraces; and small areas of Freeland soils, which are moderately well drained soils on terraces.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the sub soil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. Erosion is a hazard if row crops are grown. *Capability unit IIIw-1; woodland group 3.*

Iuka Series

Iuka soils are moderately well drained and have a dark-brown surface layer. These soils are forming in acid alluvium washed from upland soils that formed in Coastal Plain material. The main layers of a typical profile are—

0 to 8 inches, dark-brown, very friable fine sandy loam.
8 to 20 inches, dark yellowish-brown, friable fine sandy loam.
20 to 55 inches +, yellowish-brown to gray, very friable fine sandy loam distinctly mottled with shades of gray and brown.

These soils are predominantly in the eastern part of the county. They are generally in the higher lying areas or are in or near old creekbeds on the bottom lands of the Hatchie River and its tributaries. They are adjacent to and are somewhat similar to Falaya, Waverly, Bibb, Urbo, Collins, and Mantachie soils. They are sandier throughout the profile than Collins soils. They are better drained than Falaya, Mantachie, Urbo, Waverly, Bibb, and Chastain soils.

Iuka soils are strongly acid, moderate in natural fertilility, and low in organic-matter content. The root zone is moderately deep. The available water capacity is moderate, permeability is moderate, and the infiltration rate is moderate.

Iuka soils are well suited to almost all of the com monly grown crops, pasture plants, and trees. Nearly all the acreage is cleared. Excess surface water is a limitation that must be considered when cropping systems are planned. If drained, these soils are especially well suited to cotton and corn.

Iuka soils (Ik).—These are moderately well drained, acid sandy soils on the bottom lands in the eastern part of the county. The surface layer is dark-brown, very friable fine sandy loam. The upper part of the subsurface layer is dark yellowish-brown, friable fine sandy loam. The layers below a depth of about 20 inches are yellowish-brown, very friable fine sandy loam distinctly mottled with shades of gray and brown.

Included in the areas mapped are small areas of Collins soils, which are moderately well drained and silty, and small areas of Falaya, Mantachie, and Urbo soils, which are poorly drained.

Iuka soils are strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, permeability is moderate, and the infiltration rate is moderate.

These soils are well suited to almost all of the commonly grown crops, pasture plants, and trees. Excess surface water is a limitation that must be considered when cropping systems are planned. If the excess water is removed, these are some of the most productive soils in the county. They are especially well suited to cotton and corn. *Capability unit IIw–1; woodland group 7.*

Iuka soils, local alluvium (Iu).—These are moderately well drained, acid sandy soils on the bottom lands in the eastern part of the county. They occur along the smaller streams or tributaries that flow into the Hatchie River. As compared with the Iuka soils previously described, these soils are forming in less well consolidated material and ordinarily are less likely to be flooded. The surface layer is dark-brown, very friable fine sandy loam. The upper part of the subsurface layer is dark yellowish-brown, friable fine sandy loam. The layers below a depth of about 20 inches are yellowish-brown to gray fine sandy loam distinctly mottled with shades of gray and brown.

Included in the areas mapped are small areas of Collins soils, which are silty and moderately well drained, and small areas of Falaya, Mantachie, and Urbo soils, which are somewhat poorly drained.

These soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The available moisture capacity is moderate, the infiltration rate is moderate, and permeability is moderate.

These soils are well suited to almost all of the commonly grown crops, pasture plants, and trees. They are especially well suited to cotton and corn. Excess surface water is a limitation that must be considered when cropping systems are planned. *Capability unit IIw–1; woodland group 7.*

Mantachie Series

Mantachie soils are somewhat poorly drained and have a dark-brown surface layer. These soils are forming in acid alluvium washed from soils of the Coastal Plain upland. The main layers of a typical profile are—

- 0 to 7 inches, brown or dark-brown, very friable silt loam.
- 7 to 23 inches, yellowish-brown, very friable loam distinctly mottled with lighter shades of brown.
- 23 to 51 inches +, gray, friable fine sandy loam or loam distinctly mottled with shades of brown.

These soils are predominantly in the eastern part of the county. They are the dominant soils on the bottom lands along the Hatchie River and its tributaries. They are adjacent to and are somewhat similar to Collins, Falaya, Waverly, Bibb, Urbo, Chastain, and Iuka soils. They are sandier throughout the profile than Collins, Falaya, Waverly, Urbo, and Chastain soils. They are more poorly drained than Iuka soils and are better drained than Bibb soils.

These soils are strongly acid, moderate in natural fertility, and low in organic-matter content. Their root zone is shallow. The available water capacity is moderate, the infiltration rate is moderate, and permeability is moderate.

For the most part, these soils have been cleared. They are well suited to almost all of the commonly grown row crops, pasture plants, and trees. If excess water is removed, they are especially well suited to cotton and corn.

Mantachie soils (Ma).—These are somewhat poorly drained, acid sandy soils on the bottom lands in the eastern part of the county. The surface layer is brown or dark-brown, very friable silt loam and is 7 inches thick. The upper part of the subsurface layer is yellowish-brown, very friable loam distinctly mottled with lighter shades of brown. The layers below a depth of about 23 inches are gray, friable fine sandy loam or loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of sandy Iuka soils, which are moderately well drained, and sandy Bibb soils, which are poorly drained; small areas of silty Collins, Falaya, and Waverly soils; and small areas of Urbo and Chastain soils.

Mantachie soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The available water capacity is moderate, the infiltration rate is moderate, and permeability is moderate.

These soils are well suited to almost all of the commonly grown row crops, pasture plants, and trees. They are especially well suited to cotton and corn. Excess water is a limitation that must be considered when cropping systems are planned. *Capability unit IIw–4; woodland group 7.*

Mantachie soils, local alluvium (Mc).—These are somewhat poorly drained, acid sandy soils on the bottom lands in the eastern part of the county. They are along the smaller streams or tributaries that flow into the Hatchie River. As compared with the Mantachie soils previously described, these soils are forming in less well consolidated material and ordinarily are less likely to be flooded. The surface layer is brown or dark-brown, very friable silt loam and is 7 inches thick. The upper part of the subsurface layer is yellowish-brown, very friable loam distinctly mottled with lighter shades of brown. The layers below a depth of about 23 inches are gray, friable fine sandy loam or loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of Collins and Iuka soils, which are moderately well drained; small areas of silty Falaya soils and clayey Urbo soils, both of which are somewhat poorly drained; and small areas of Waverly, Bibb, and Chastain soils, which are poorly drained.

These Mantachie soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The available water capacity is moderate, the infiltration rate is moderate, and permeability is moderate.

These soils are well suited to almost all of the commonly grown crops, pasture plants, and trees . They are especially well suited to cotton and corn. Excess water is a limitation that must be considered when cropping systems are planned. *Capability unit IIw–4; woodland group 7.*

Mantachie soils, overflow (Mf).—These are somewhat poorly drained, acid silty soils on the bottom lands in the eastern part of the county. They are subject to flooding that does very severe damage to crops. The surface layer is brown or dark-brown, very friable silt loam and is 7 inches thick. The upper part of the subsurface layer is

yellowish-brown, very friable loam distinctly mottled with lighter shades of brown. The layers below a depth of about 23 inches are gray, friable fine sandy loam or loam distinctly mottled with shades of brown.

Included in the areas mapped are small areas of Collins and Iuka soils, which are moderately well drained; small areas of silty Falaya soils and clayey Urbo soils, both of which are somewhat poorly drained; and small areas of Waverly, Bibb, and Chastain soils, which are poorly drained.

These Mantachie soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The available water capacity is moderate, the infiltration rate is moderate, and permeability is moderate.

Because of the flood hazard, these soils are best suited to trees. If protected from flooding, they are well suited to most commonly grown crops and are especially well suited to cotton and corn. Most of the acreage is woodland or summer pasture. *Capability unit Vw-1; woodland group 7.*

Mixed Alluvial Land

Mixed alluvial land, a land type that is moderately well drained or somewhat poorly drained, occurs throughout the county as long, narrow areas bordering the larger streams. It consists of alternate layers of acid sandy alluvium and acid silty alluvium.

This land type is adjacent to and somewhat similar to alluvial soils, such as Collins, Falaya, Waverly, Bibb, Urbo, Chastain, Iuka, and Mantachie soils. It is sandier than these soils and is well stratified throughout the profile.

The organic-matter content is low, and the natural fertility is low. Permeability is variable, the infiltration rate is slow to moderate, and the available water capacity is moderate.

For the most part, this land type has been cleared. Except in years when the growing season is extremely dry, it is well suited to all the commonly grown crops. It is also suited to pasture and woodland. The soil material is easy to work, but it is likely to crust and pack. A plowpan forms readily.

Mixed alluvial land (Mn).—This is a moderately well drained to somewhat poorly drained land type that occurs throughout the county as long, narrow areas bordering the larger streams. It covers about 1 percent of the county.

Included in the areas mapped are small areas of Iuka and Collins soils, which are moderately well drained; small areas of Mantachie, Falaya, and Urbo soils, which are somewhat poorly drained; and small areas of Waverly, Bibb, and Chastain soils, which are poorly drained.

This land type is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is slow to moderate. Permeability is variable.

Except in years when the growing season is extremely dry, this land type is well suited to all of the commonly grown crops. It is also suited to pasture and woodland. The soil material is easy to work, but it is likely to crust and pack. A plowpan forms readily. *Subclass IVw (no unit classification); woodland group 13.*

Mixed alluvial land, overflow (Mo).—This is a moderately well drained to somewhat poorly drained land type that occurs throughout the county as long, narrow areas bordering streams. It is subject to very severe damage from flooding.

Included in the areas mapped are small areas of Iuka and Collins soils, which are moderately well drained; small areas of Mantachie and Falaya soils, which are somewhat poorly drained; and small areas of Waverly, Bibb, and Chastain soils, which are poorly drained.

This land type is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is slow to moderate. Permeability is variable.

For the most part, this land type is used as woodland and summer pasture. If protected from flooding, it is well suited to most commonly grown crops and is especially well suited to cotton and corn. *Capability unit Vw-1; woodland group 13.*

Ora Series

Ora soils are moderately well drained or well drained, acid upland soils that have a compact and brittle fragipan. These soils formed in medium-textured and coarse-textured Coastal Plain material. The main layers of a typical profile are—

0 to 6 inches, dark-brown, very friable silt loam.
6 to 28 inches, yellowish-red, friable heavy loam distinctly mottled with shades of yellow in lower part.
28 to 52 inches, compact and brittle fragipan of strong-brown sandy loam mottled with lighter shades of brown.
52 to 60 inches +, reddish-brown, friable sandy clay loam distinctly mottled with lighter shades of brown.

These soils are in the eastern part of the county, on narrow ridgetops and side slopes. They have slopes of less than 12 percent. They are adjacent to and similar to Atwood, Providence, Dulac, and Ruston soils. They are sandier throughout the profile than Providence and Dulac soils. Atwood and Ruston soils lack a fragipan.

Ora soils are low in natural fertility, low in organic-matter content, and strongly acid. The root zone is moderately deep. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the profile and slow in the fragipan.

Ora soils are easy to work, but they crust and pack when bare. A plowpan is likely to form. In cultivated areas there is an erosion hazard, and it becomes more serious with increase in slope. If well managed, these soils are productive of almost all of the commonly grown crops. Most of the acreage has been cleared and used for row crops and pasture. Because of changes in the economy, however, much of the acreage is being reforested.

Ora silt loam, 2 to 5 percent slopes, eroded (OsB2).—This is a well drained or moderately well drained, acid upland soil that has a brittle and compact fragipan. It occurs on ridgetops. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is predominantly dark-brown, very friable silt loam to loam but includes scattered patches of yellowish-red heavy loam turned up by plowing. There are also rills and shallow gullies and a few deep gullies in which the yellowish-red subsoil is exposed.

The upper part of the subsoil is yellowish-red heavy loam. The fragipan, which is at a depth of about 28

inches, is strong-brown sandy loam mottled with shades of brown. The material below a depth of about 52 inches is reddish-brown, friable sandy clay loam mottled with lighter shades of brown.

Included in the areas mapped are small areas of Ruston and Atwood soils, which are well drained and lack a fragipan; and small areas of silty Dulac, Providence, and Bude soils, which have a fragipan.

This soil is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is moderately slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIe–2; woodland group 4.*

Ora loam, 2 to 5 percent slopes, severely eroded (OrB3).—This is a well drained or moderately well drained, acid upland soil that has a brittle and compact fragipan. It occurs on ridgetops. Most of the original surface layer has been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is predominantly very friable, strong-brown loam but includes scattered patches that are dark brown. There are a few rills and shallow gullies and a few deep gullies. The upper part of the subsoil is yellowish-red, friable heavy loam. The fragipan, which is at a depth of about 25 inches, is strong-brown sandy loam mottled with lighter shades of brown. The material below a depth of about 49 inches is reddish-brown sandy clay loam distinctly mottled with lighter shades of brown.

Included in the areas mapped are small areas of Ruston and Atwood soils, which are well drained and lack a fragipan; and small areas of silty Dulac, Providence, and Bude soils, which have a fragipan.

This soil is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is moderately slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, this soil is fairly productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. There is a severe erosion hazard if row crops are grown. *Capability unit IIIe–2; woodland group 4.*

Ora silt loam, 5 to 8 percent slopes, eroded (OsC2).—This is a well drained or moderately well drained, acid upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It consists predominantly of dark-brown, very friable silt loam to loam but includes scattered patches of yellowish-red clay loam. There are rills and shallow gullies and a few deep gullies where the yellowish-red subsoil is exposed.

The upper part of the subsoil is yellowish-red heavy loam. The fragipan, which is at a depth of about 28 inches, is strong-brown sandy loam mottled with lighter shades of brown. The material below a depth of about 52 inches is reddish-brown, friable sandy clay loam mottled with lighter shades of brown.

Included in the areas mapped are small areas of Ruston and Atwood soils, which are well drained and lack a fragipan; and small areas of silty Dulac, Providence, and Bude soils, which have a fragipan.

This soil is strongly acid, low in natural fertility, and low in organic matter content. The infiltration rate is moderately slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. The available water capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, however, this soil is fairly productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe–2; woodland group 4.*

Ora loam, 5 to 8 percent slopes, severely eroded (OrC3).—This is a well drained or moderately well drained, acid upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is chiefly yellowish-red, very friable loam but includes patches of clay loam. There are rills and shallow gullies and a few deep gullies. The upper part of the subsoil is yellowish-red, friable heavy loam. The fragipan, which is at a depth of about 25 inches, is strong-brown sandy loam mottled with lighter shades of brown. Below a depth of about 49 inches, the subsoil is reddish-brown sandy clay loam distinctly mottled with lighter shades of brown.

Included in the areas mapped are small areas of Ruston and Atwood soils, which are well drained and lack a fragipan; and small areas of silty Dulac, Providence, and Bude soils, which have a fragipan.

This soil is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is moderately slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The available moisture capacity is moderate.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, however, this soil is fairly productive of all crops commonly grown in the area. It is well suited to pasture plants and pine trees. There is a severe erosion hazard if row crops are grown. *Capability unit IVe–2; woodland group 4.*

Ora loam, 8 to 12 percent slopes, severely eroded (OrD3). This is a well drained or moderately well drained, acid upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present surface layer, which is a mixture of remnants of the original surface layer and the upper part of the subsoil, is chiefly yellowish-red loam but includes patches of strong-brown clay loam. There are a few rills and shallow gullies and a few deep gullies.

The upper part of the subsoil is yellowish-red, friable heavy loam. The fragipan, which is at a depth of about 25 inches, is strong-brown sandy loam mottled with lighter shades of brown. Below a depth of about 49 inches, the subsoil is reddish-brown sandy clay loam distinctly mottled with lighter shades of brown.

Included in the areas mapped are small areas of Ruston and Atwood soils, which are well drained and lack a fragipan; and small areas of silty Dulac and Providence soils, which have a fragipan.

This soil is strongly acid, low in natural fertility, and low in organic-matter content. The infiltration rate is moderately slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The available water capacity is moderate.

Because of the slope and the erosion hazard, this soil is not suitable for cultivation. Pastures respond well to fertilizer, but they yield little forage during dry periods because this soil tends to be droughty. *Capability unit VIe-1; woodland group 4.*

Providence Series

Providence soils are moderately well drained, acid silty soils that have a brittle and compact fragipan. These soils formed in thin loess over friable Coastal Plain material. The main layers of a typical profile are—

- 0 to 8 inches, brown, very friable silt loam.
- 8 to 27 inches, yellowish-red, friable silty clay loam faintly mottled with shades of brown in lower part.
- 27 to 36 inches, compact and brittle fragipan of yellowish-red silt loam distinctly mottled with shades of brown and gray.
- 36 to 58 inches +, red, friable light clay loam; cracks containing strong-brown material.

These soils cover about 5 percent of the county. They are in the western part, on narrow to broad ridgetops and upper side slopes. They have slopes of less than 12 percent. They are adjacent to and similar to Atwood, Dulac, Ora, and Ruston soils. They are siltier in the surface layer and upper part of the subsoil than Ora and Ruston soils. They are ordinarily less red than Atwood soils, which lack a fragipan. They are underlain by coarser textured material than are the Dulac soils.

Providence soils are moderate in natural fertility, low in organic-matter content, and strongly acid. The root zone is moderately deep. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

For the most part, Providence soils have been cleared and are now in row crops and pasture. If well managed, they are productive of all crops commonly grown in the county. If cultivated, they are subject to erosion, and the hazard is more serious with increase in slope.

Providence silt loam, 2 to 5 percent slopes, eroded (PdB2).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is predominantly brown silt loam but includes yellowish-red patches. There are rills and shallow gullies and a few deep gullies. The upper part of the subsoil is yellowish-red silty clay loam. The fragipan, which is at a depth of about 27 inches, is yellowish-red silt loam distinctly mottled with shades of brown and gray. Below a depth of about 36 inches, the subsoil is red, friable light clay loam with cracks that contain strong-brown material.

Included in the areas mapped are small areas of sandier Ruston and Ora soils; small areas of silty Atwood soils, which lack a fragipan; and small areas of silty Dulac soils, which have a fragipan underlain by fine-textured material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available moisture capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is fairly productive of all crops commonly grown in the area. It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIe-2; woodland group 2.*

Providence silt loam, 2 to 5 percent slopes, severely eroded (PdB3).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present surface layer is predominantly subsoil material but includes scattered patches of the original surface layer. It is ordinarily strong-brown heavy silt loam with patches of brown silt loam. Also included are small areas where the texture is silty clay loam. There are rills and shallow gullies and a few deep gullies. The upper part of the subsoil is yellowish-red, friable silty clay loam. The fragipan, which is at a depth of about 24 inches, is yellowish-red silt loam distinctly mottled with shades of brown and gray. Below a depth of about 33 inches, the subsoil is red, friable light clay loam with cracks that contain strong-brown material.

Included in the areas mapped are small areas of silty Atwood soils, which lack a fragipan; small areas of sandier Ruston and Ora soils; and small areas of silty soils that have a fragipan underlain by fine-textured material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is fairly productive of all crops commonly grown in the area. It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe-2; woodland group 2.*

Providence silt loam, 5 to 8 percent slopes, eroded (PdC2). This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. The surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is predominantly brown silt loam but includes yellowish-red patches. There are rills and shallow gullies and a few deep gullies.

The upper part of the subsoil is yellowish-red silty clay loam. The fragipan, which is at a depth of about 27

inches, is yellowish-red silt loam distinctly mottled with shades of brown and gray. Below a depth of about 36 inches, the subsoil is red, friable light clay loam with cracks that contain strong-brown material.

Included in the areas mapped are small areas of sandier Ruston and Ora soils; small areas of silty Atwood soils, which lack a fragipan; and small areas of silty soils that have a fragipan underlain by fine-textured material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form. If adequately fertilized and otherwise well managed, however, this soil is fairly productive of all crops commonly grown in the area. It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IIIe 2; woodland group 2.*

Providence silt loam, 5 to 8 percent slopes, severely eroded (PdC3).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and upper side slopes. Most of the original surface layer has been removed by erosion. The present surface layer is predominantly subsoil material but includes patches of the original surface layer. It is ordinarily strong-brown heavy silt loam with patches of brown silt loam. Also included are small areas where the texture is silty clay loam. There are rills and shallow gullies and a few deep gullies.

The upper part of the subsoil is yellowish-red, friable silty clay loam. The fragipan, which is at a depth of about 24 inches, is yellowish-red silt loam distinctly mottled with shades of brown and gray. Below a depth of about 33 inches, the subsoil is red, friable light clay loam with cracks that contain strong-brown material.

Included in the areas mapped are small areas of silty Atwood soils, which lack a fragipan; small areas of sandier Ruston and Ora soils; and small areas of silty Dulac soils, which have a fragipan underlain by fine-textured material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. If adequately fertilized and otherwise well managed, it is fairly productive of all crops commonly grown in the area. It is also well suited to pasture plants and pine trees. Erosion is a hazard if row crops are grown. *Capability unit IVe-2; woodland group 2.*

Providence silt loam, 8 to 12 percent slopes, severely eroded (PdD3).—This is a moderately well drained upland soil that has a brittle and compact fragipan. It occurs on ridgetops and side slopes. Most of the original surface layer has been removed by erosion. The present surface layer is predominantly subsoil material but includes remnants of the original surface layer. It is generally strong-brown heavy silt loam with small patches of brown silt loam, but in some small areas it is silty clay loam. There are rills and shallow gullies and a few deep gullies.

The upper part of the subsoil is yellowish-red, friable silty clay loam. The fragipan, which is at a depth of about 24 inches, is yellowish-red silt loam distinctly mottled with shades of brown and gray. Below a depth of about 33 inches, the subsoil is red, friable light clay loam with cracks that contain strong-brown material.

Included in the areas mapped are small areas of silty Atwood soils, which lack a fragipan; small areas of sandier Ruston and Ora soils; and small areas of silty Dulac soils, which have a fragipan underlain by fine-textured material.

This soil is strongly acid, moderate in natural fertility, and low in organic-matter content. The available water capacity is moderate, and the infiltration rate is slow. Permeability is moderate in the upper part of the subsoil and slow in the fragipan.

This soil is easy to work, but it crusts and packs readily. A plowpan is likely to form.

Because of the slope and the erosion hazard, this soil is not suitable for cultivation. It is suitable for pasture but, because of droughtiness, is not highly productive. Most of the acreage has been cleared and has been in row crops. In recent years much of it has been reforested with pine trees. *Capability unit VIe-1; woodland group 2.*

Ruston Series

Ruston soils are well drained and have a subsoil of yellowish red sandy clay loam. These soils formed in red, acid, friable Coastal Plain material. The main layers of a typical profile are—

0 to 16 inches, dark-brown, very friable loamy sand or sandy loam; yellowish red in lower part.
16 to 44 inches, red, friable sandy clay loam.
44 to 72 inches +, red, very friable sandy loam; pockets of brown material.

These soils occur on narrow ridgetops and side slopes in all parts of the county. They have slopes of more than 12 percent. They are adjacent to and similar to Providence, Atwood, Wilcox, Cuthbert, Dulac, and Ora soils. They are sandier in the surface layer and the upper part of the subsoil than Providence, Wilcox, Atwood, and Dulac soils. They are better drained than Cuthbert soils and are coarser textured in the lower part of the profile. Ora soils have a fragipan, but Ruston soils do not.

Ruston soils are low in natural fertility, low in organic-matter content, and strongly acid. They respond well to fertilization. The available water capacity is moderate. Permeability and the infiltration rate are moderate.

Most of the acreage has never been cleared. Because of the slope and the erosion hazard, these soils are best suited to trees. If well managed, they can be used for pasture. Only a small acreage is in pasture.

Ruston soils, 12 to 17 percent slopes (RnE).—These are sandy, well-drained soils on narrow ridgetops and side slopes. The surface layer is dark-brown sandy loam or loamy sand. The upper part of the subsoil is red, friable sandy clay loam. Below a depth of about 44 inches, the subsoil is red, very friable sandy loam.

Included in the areas mapped are small areas of silty Atwood, Providence, and Dulac soils; small areas of

sandy Ora soils, which have a fragipan; and small areas of clayey Cuthbert, Shubuta, and Wilcox soils.

These soils are low in natural fertility, low in organic-matter content, and strongly acid. They respond well to fertilization. The available water capacity is moderate. Permeability and the infiltration rate are moderate.

Because of the slope and the erosion hazard, these soils are not suitable for cultivation. If well managed, they can be used for pasture. *Capability unit VIe-2; woodland group 1.*

Ruston soils, 12 to 17 percent slopes, eroded (RnE2).—These are sandy, well-drained soils on narrow ridgetops and side slopes. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. It is dark-brown sandy loam but includes patches of red sandy clay loam. The upper part of the subsoil is red, friable sandy clay loam. Below a depth of about 40 inches, the subsoil is red, very friable sandy loam. There are rills and shallow gullies and a few deep gullies.

Included in the areas mapped are small areas of sandy Ora soils, which have a fragipan; small areas of silty Atwood, Providence, and Dulac soils; and small areas of clayey Cuthbert, Shubuta, and Wilcox soils.

These soils are low in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer. The available water capacity is moderate. Permeability and the infiltration rate are moderate.

Because of the slope and the erosion hazard, these soils are not suitable for cultivation. If well managed, they can be used for pasture. *Capability unit VIe 2; woodland group 1.*

Ruston soils, 17 to 45 percent slopes (RnF).—These are well-drained, acid upland soils. Ordinarily, the surface layer is dark-brown loamy sand or sandy loam and is about 16 inches thick, and the upper part of the subsoil is red, friable sandy clay loam. Below a depth of about 44 inches, the subsoil is red, friable sandy loam with pockets of brown material.

Included in the areas mapped are small areas of silty Atwood, Providence, and Dulac soils, and small areas of sandy Ora soils, which have a fragipan.

These soils are low in natural fertility and low in organic-matter content. Permeability and the infiltration rate are moderate. The available water capacity is moderate.

Because of the slope and the erosion hazard, it is not practical to use these soils for row crops. If well managed, the smoother slopes can be used for pasture. These soils are suited to pine trees and to some hardwoods. *Capability unit VIIe-1; woodland group 1.*

Ruston-Cuthbert association, moderately steep (RsE). This association consists of large areas made up of well drained Ruston soils and moderately well drained Cuthbert soils, generally in about the same pattern and proportion. Ruston soils are on the ridges and steep side slopes and cover about 58 percent of the association. Cuthbert soils, which make up about 22 percent of the association, are chiefly on the middle and lower parts of the slopes; a few areas are on the narrow ridges and the upper parts of the slopes. The rest of the association consists of clayey Wilcox soils, which are somewhat poorly drained; silty and loamy Providence and Ora soils, both of which have a fragipan; and loamy sand areas that are excessively drained.

The landscape is one of narrow, winding ridgetops and steep side slopes. The slope range is 12 to 17 percent. Most of the acreage is forested.

The Ruston soils in this association are well drained. They formed in thick beds of acid, predominantly coarse-textured Coastal Plain material.

The main layers of a typical profile are—

- 0 to 16 inches, dark-brown, very friable loamy sand; yellowish red in lower part.
- 16 to 44 inches, red, friable sandy clay loam.
- 44 to 72 inches +, red, very friable sandy loam; pockets of brown material.

The Cuthbert soils in this association are moderately well drained. They formed in predominantly fine-textured, stratified, acid Coastal Plain material. The main layers of a typical profile are—

- 0 to 6 inches, yellowish-brown, very friable fine sandy loam; upper part is dark gray.
- 6 to 25 inches, yellowish-red to strong-brown, plastic clay mottled with shades of brown in lower part.
- 25 to 58 inches +, strong-brown to olive-gray, plastic sandy clay mottled with shades of gray, red, and brown.

The Ruston soils in this association have lost about half of their original surface layer through erosion. The present surface layer includes patches of the original surface layer, which was dark-brown or very dark grayish-brown sandy loam or loamy sand, and patches of red, friable sandy clay loam from the upper part of the subsoil. At a depth of about 3 feet, the material is red, very friable sandy loam that has pockets of brown material.

The Cuthbert soils in this association have lost about half of their original surface layer through erosion. There are patches of dark-gray and yellowish-brown, very friable sandy loam, which are remnants of the original surface layer, and patches of yellowish-red clay from the upper part of the subsoil. At a depth of about 22 inches, the material is strong-brown to olive-gray, plastic sandy clay mottled with shades of gray, red, and brown. There are rills and shallow gullies and a few deep gullies.

These soils are strongly acid and low in natural fertility. Permeability and the infiltration rate are moderate in Ruston soils and slow in Cuthbert soils. Both soils have moderate available water capacity.

Because of the slope and the erosion hazard, these soils are not suitable for cultivation. They respond well to applications of lime and fertilizer, however, and if well managed can be used for pasture. *Ruston soils: Capability unit VIe-2; woodland group 11. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 11.*

Ruston-Cuthbert association, moderately steep, eroded (RsE2). This association consists of well drained Ruston soils and moderately well drained Cuthbert soils, in about the same pattern and proportion in all areas mapped.

Ruston soils are on the ridges and steep side slopes and cover about 58 percent of the association. Cuthbert soils, which make up about 22 percent of the association, are chiefly on the middle and lower parts of the slopes; a few areas are on the narrow ridges and the upper parts of the slopes. The rest of the association consists of clayey Wilcox soils, which are somewhat poorly drained; silty and loamy Providence and Ora soils, both of which are

moderately well drained and have a fragipan; and loamy sand areas that are excessively drained.

The landscape is one of narrow, winding ridgetops and side slopes. The slope range is 12 to 17 percent. Approximately 70 percent of the acreage is woodland. The rest is used for pasture.

These soils are strongly acid and low in natural fertility. Permeability and the infiltration rate are moderate in Ruston soils and slow in Cuthbert soils. Both soils have moderate available water capacity.

Because of the slope and the erosion hazard, these soils are not suitable for cultivation. They respond well to applications of lime and fertilizer, however, and if well managed can be used for pasture. *Ruston soils: Capability unit VIIe-1; woodland group 11. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 11.*

Ruston-Cuthbert association, steep (RsF).—This association consists of large areas made up of well drained Ruston soils and moderately well drained Cuthbert soils, generally in about the same pattern and proportion. Ruston soils are on the ridges and very steep side slopes and cover about 58 percent of the association. Cuthbert soils, which make up about 22 percent of the association, are chiefly on the middle and lower parts of the slopes; a few areas are on the narrow ridges and the upper parts of the slopes. The rest of the association consists of clayey Wilcox soils, which are somewhat poorly drained; silty and loamy Providence and Ora soils, which are moderately well drained; and loamy sand areas that are excessively drained.

The landscape is one of narrow, winding ridgetops and very steep side slopes. The slope range is 17 to 45 percent. Most of the acreage is forested.

About 10 percent of this association consists of soils that have lost about half of their original surface layer through erosion. The present surface layer consists of scattered patches of sandy loam or loamy sand (remnants of the original surface layer) and patches of finer textured, redder material from the upper part of the subsoil. There are a few rills and shallow gullies and a few deep gullies in these areas.

The Ruston soils in this association are well drained. They formed in thick beds of acid, predominantly coarse-textured Coastal Plain material. The surface layer is about 16 inches thick. Generally it consists of very friable fine sandy loam or loamy sand, very dark grayish brown in the upper part and dark brown in the lower part. This layer overlies about 28 inches of red, friable sandy clay loam that grades to red, very friable sandy loam at a depth of about 44 inches.

The Cuthbert soils in this association have a 6 inch surface layer of yellowish-brown sandy loam, dark gray in the upper part and yellowish brown in the lower part. This layer overlies a yellowish-red to strong-brown, plastic clay subsoil mottled with shades of brown in the lower part. The material at a depth of about 25 inches consists of alternate layers, or strata, of strong-brown to olive-gray, plastic sandy clay.

These soils are strongly acid and are low in natural fertility. Permeability and the infiltration rate are moderate in Ruston soils and slow in Cuthbert soils. Both soils are moderate in available water capacity.

Because of the steep slope and the erosion hazard, these soils are not suitable for cultivation. They respond well to applications of lime and fertilizer, however, and if well managed can be used for pasture. *Ruston soils: Subclass VIIe (no unit classification); woodland group 11. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 11.*

Ruston-Cuthbert-Shubuta association, moderately steep, eroded (RuE2).—This association consists of well drained Ruston soils, moderately well drained Cuthbert soils, and moderately well drained Shubuta soils. The acreage is small. About 57 percent of the association is Ruston soils, 25 percent is Cuthbert soils, and the rest is Shubuta soils. The proportion of each soil is fairly uniform from one area of this association to another, but the pattern of soils varies.

The landscape is highly dissected by a dendritic drainage system. The slope range is 12 to 17 percent. Most of the acreage has been cultivated but has reverted to pine trees. The rest is in pasture.

Ruston soils occur on narrow ridges and on steep side slopes. They have lost about half of their original surface layer through erosion. The present surface layer is a mixture of the original surface layer and the upper part of the subsoil. There are patches of very dark grayish-brown to dark-brown sandy loam (remnants of the original surface layer) and patches of red sandy clay loam from the upper part of the subsoil. The main layers of a typical Ruston profile are—

- 0 to 16 inches, dark-brown, very friable loamy sand or sandy loam: yellowish red in lower part.
- 16 to 44 inches, red, friable sandy clay loam.
- 44 to 72 inches +, red, very friable sandy loam; pockets of brown material.

Cuthbert soils are mainly on side slopes but do occur on ridges. About half of the original surface layer has been removed by erosion. There are patches of dark-gray fine sandy loam (remnants of the original surface layer) and patches of yellowish-red clay from the upper part of the subsoil.

Cuthbert soils are described under the heading "Cuthbert Series." The main layers of a typical profile are—

- 0 to 6 inches, yellowish-brown, very friable fine sandy loam; dark gray in the upper part.
- 6 to 25 inches, yellowish-red to strong brown, plastic clay mottled with shades of brown in the lower part.
- 25 to 58 inches +, strong-brown to olive gray, plastic sandy clay mottled with shades of gray, red, and brown.

Shubuta soils are generally on narrow ridges and side slopes. They have lost about half of their original surface layer through erosion. There are patches of black to yellowish brown loam which are remnants of the original surface layer, and patches of strong-brown clay loam from the upper part of the subsoil.

Shubuta soils are described under the heading "Shubuta Series." The main layers of a typical profile are—

- 0 to 7 inches, yellowish brown friable loam; black in upper part.
- 7 to 38 inches, strong brown to yellowish-red, slightly plastic clay loam; lower part is mottled with shades of brown and is about 10 percent clay shale fragments.
- 38 to 60 inches +, strong-brown, slightly plastic clay loam mottled with shades of red; about 15 percent clay shale fragments.

The soils in this association are strongly acid, low in organic-matter content, and low in natural fertility. Permeability and the infiltration rate are moderate in Ruston soils and slow in Cuthbert and Shubuta soils. All of these soils are moderate in available water capacity.

Rills, shallow gullies, and a few deep gullies occur throughout this association. Because of the steep slopes, the erosion hazard is severe. These soils are not suitable for cultivation. *Ruston soils: Capability unit VIIe-1; woodland group 11. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 11. Shubuta soils: Subclass VIIe (no unit classification); woodland group 11.*

Ruston-Cuthbert-Shubuta association, steep (RuF).—This association consists of well drained Ruston soils, moderately well drained Cuthbert soils, and moderately well drained or well drained Shubuta soils. It occurs as large areas; many are 300 to 500 acres or more in size. About 57 percent of the association consists of Ruston soils, 25 percent of Cuthbert soils, and the rest of Shubuta soils. The proportion of each soil is fairly uniform from one area of this association to another, but the pattern of soils varies.

The landscape is highly dissected by a dendritic drainage system. The slope range is 17 to 45 percent.

Ruston soils occur on narrow ridges and very steep side slopes. They generally have a thick surface layer of loamy sand or sandy loam; the upper part is very dark grayish brown, and the lower part is dark brown. This layer overlies a subsoil of red, friable sandy clay loam. The underlying material is red, very friable sandy loam with pockets of brown material.

Cuthbert soils are mainly on side slopes, but they occur on ridges in some places. They generally have a 3- to 6-inch surface layer of dark-gray to yellowish-brown fine sandy loam and a subsoil of yellowish-red to strong-brown, plastic clay distinctly mottled with shades of brown in the lower part. Below a depth of 25 inches, the material generally is distinctly to prominently mottled strong-brown, olive-gray, and yellowish-red sandy clay; gray becomes more prominent with increase in depth.

Shubuta soils are generally on narrow ridges and on the upper parts of the side slopes. They have a surface layer 7 inches thick. The upper 3 inches is black, and the lower part is yellowish brown. The upper 6 inches of the subsoil is strong-brown clay loam. This grades into yellowish-red heavy clay loam. The underlying material is strong-brown heavy clay loam mottled with shades of yellow and red.

The soils in this association are strongly acid, low in natural fertility, and low in organic-matter content. Permeability and the infiltration rate are moderate in Ruston soils and slow in Cuthbert and Shubuta soils. All of these soils have moderate available water capacity.

Because of the steep slopes, the erosion hazard is severe. These soils are not suitable for cultivation. *Ruston soils: Subclass VIIe (no unit classification); woodland group 11. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 11. Shvbuta soils: Subclass VIIe (no unit classification); woodland group 11.*

Shubuta Series

Shubuta soils are moderately well drained or well drained. They formed in acid, stratified clay loams, clays, and clay shales of the Coastal Plain.

These soils are on narrow ridges and steep and very steep hillsides, mostly in the area east of the Hatchie River. They are adjacent to and are somewhat similar to Ruston, Cuthbert, and Ora soils. They have a greater clay content than Ruston soils, particularly in the lower part of the profile. Their subsoil is redder and thicker than that of Cuthbert soils and has fewer mottles. Ora soils have a fragipan but Shubuta soils do not.

Shubuta soils are strongly acid, low in natural fertility, and low in organic-matter content. The available water capacity is moderate to low. The root zone is deep.

In Tippah County, Shubuta soils are mapped as part of a soil association. The main layers of a typical profile are described under the heading "Ruston-Cuthbert-Shubuta association, moderately steep, eroded (RuE2)."

Tickfaw Series

Tickfaw soils are poorly drained. The subsoil is mottled gray silty clay loam. These soils formed in thin loess underlain by light-gray clayey Coastal Plain material. The main layers of a typical profile are—

- 0 to 6 inches, dark grayish-brown, friable silt loam.
- 6 to 14 inches, gray, friable silty clay loam distinctly mottled with shades of brown.
- 14 to 24 inches, gray, friable silty clay loam distinctly mottled with shades of brown.
- 24 to 60 inches +, gray, slightly plastic silty clay mottled with shades of brown.

These soils occur as broad, nearly level areas in the Interior Flatwoods. They have slopes of less than 2 percent. They are adjacent to Falkner, Providence, Dulac, and Bude soils but are more poorly drained than any of those soils.

Tickfaw soils are low in natural fertility and are strongly acid. They respond well to applications of lime and fertilizer. The root zone is very shallow. The infiltration rate is slow. Permeability is moderate in the upper part of the subsoil but slow in the finer textured part. The available water capacity is moderate.

Tickfaw soils are easy to work, but they crust and pack when bare. A plowpan forms readily. These soils are suited to pasture plants and trees and are fairly well suited to some row crops.

Tickfaw silt loam (Tc).—This is a poorly drained, acid upland soil formed in a mixture of loess and fine-textured Coastal Plain material. The slope is 0 to 2 percent. The surface layer ordinarily is dark grayish-brown to gray, friable silt loam and is about 14 inches thick. The upper part of the subsoil is gray, friable silty clay loam distinctly mottled with shades of brown. At a depth of about 24 inches, the subsoil is gray, slightly plastic silty clay mottled with shades of brown. The lower part of the underlying material is yellowish brown.

Included in some of the areas mapped are small areas of silty Bude and Falkner soils, which are somewhat poorly drained, and small areas of silty Dulac and Providence soils, which are moderately well drained.

This soil is low in natural fertility and contains little organic matter. The infiltration rate is slow. Permea-

bility is moderate in the upper part of the subsoil but slow in the fine-textured underlying material. The available water capacity is moderate.

If moisture conditions are favorable, this soil is easy to cultivate. It has poor internal drainage, which limits its use for cultivation, and it is likely to crust and pack. A plowpan forms readily. If well managed, however, this soil is fairly well suited to such row crops as corn and sorghum. It is well suited to pasture plants, pine trees, and some hardwoods. *Capability unit IIIw-2; woodland group 5.*

Urbo Series

Urbo soils are somewhat poorly drained, acid soils that are forming in fine-textured Coastal Plain alluvium. The main layers of a typical profile are—

- 0 to 6 inches, dark brown, slightly plastic light silty clay loam.
- 6 to 10 inches, dark-brown, very plastic silty clay loam faintly mottled with shades of brown.
- 10 to 25 inches, grayish-brown, very plastic silty clay mottled with shades of brown.
- 25 to 42 inches +, grayish-brown, very plastic silty clay loam faintly mottled with shades of brown.

These soils are on bottom lands in the Interior Flatwoods, generally in the lower, or slack-water, areas along Muddy Creek and Tippah Creek and their tributaries. They are adjacent to and are somewhat similar to Falaya, Collins, Waverly, Bibb, Chastain, Iuka, and Mantachie soils. They are more poorly drained and finer textured, particularly in the subsoil, than Collins and Iuka soils. They are finer textured than Falaya and Mantachie soils and are better drained than Chastain, Waverly, and Bibb soils.

Urbo soils are moderately fertile and strongly acid. They respond well to applications of lime and fertilizer. The root zone is shallow. The available water capacity is high. Permeability and the infiltration rate are moderate.

Urbo soils are well suited to most of the commonly grown pasture plants and close-growing crops. They are also suited to some hardwoods. They are fairly well suited to most of the commonly grown row crops. Excess water is a limitation that must be considered when cropping systems are planned.

Urbo silty clay loam (Ur).—This is a somewhat poorly drained soil on the bottom lands. The surface layer is dark-brown, slightly plastic light silty clay loam and is about 6 inches thick; the lower part is dark-brown, very plastic silty clay loam. The layer at a depth of about 10 inches is grayish-brown, very plastic silty clay faintly mottled with shades of brown. Below a depth of about 25 inches, the material is grayish-brown, very plastic silty clay loam faintly mottled with shades of brown.

Included in the areas mapped are small areas of Iuka and Collins soils, which are moderately well drained soils on the bottom lands; small areas of coarser textured Falaya, Urbo, and Mantachie soils, which are somewhat poorly drained; and small areas of poorly drained Waverly and Bibb soils.

This soil is strongly acid and moderately fertile. It responds well to applications of lime and fertilizer. The available water capacity is high. Permeability and the infiltration rate are moderate.

This soil is well suited to most of the commonly grown pasture plants and close-growing crops and is especially well suited to annual lespedeza and soybeans. It is also well suited to some hardwoods. It is fairly well suited to most of the commonly grown row crops. Excess water is a limitation that must be considered when cropping systems are planned. A water-disposal system that includes V-type and W-type ditches and properly arranged crop rows is needed for the removal of surface water. *Capability unit IIw-4; woodland group 8.*

Waverly Series

Waverly soils are poorly drained. The surface layer is grayish-brown silt loam, and the upper part of the subsoil is mottled silt loam. These soils are forming in alluvium washed from loessal upland soils. The main layers of a typical profile are—

- 0 to 5 inches, grayish-brown, friable silt loam distinctly mottled with shades of brown.
- 5 to 14 inches, grayish-brown, friable silt loam distinctly mottled with shades of brown.
- 14 to 23 inches +, grayish-brown, slightly sticky silty clay loam distinctly mottled with shades of gray, brown, and red.

These soils are generally in the lower, or slack-water, areas on the bottom lands in the western part of the county. They are adjacent to and are somewhat similar to Falaya, Bibb, Urbo, Chastain, and Mantachie soils. They are more poorly drained than Falaya, Urbo, and Mantachie soils. They are siltier than Chastain and Bibb soils.

Waverly soils are strongly acid, low in natural fertility, and low in organic-matter content. The root zone is very shallow. The available water capacity is moderate to low. The infiltration rate is slow, and permeability is moderate to slow. These soils are suited to pasture, to close-growing forage or grain crops, and to some row crops. They are also suited to some hardwoods.

Waverly and Bibb soils (Wb). These are poorly drained silty and sandy soils that occur on bottom lands in all parts of the county. The acreage is small. The main layers of a typical Waverly profile are—

- 0 to 5 inches, grayish-brown, friable silt loam distinctly mottled with shades of brown.
- 5 to 14 inches grayish-brown, friable silt loam distinctly mottled with shades of brown.
- 14 to 43 inches +, grayish-brown, slightly plastic silty clay loam distinctly mottled with shades of gray, brown, and red.

Bibb soils are described under the heading "Bibb Series." The main layers of a typical profile are

- 0 to 7 inches, grayish brown, friable loam mottled with shades of brown.
- 7 to 44 inches, light-gray, friable loam distinctly mottled with shades of brown; sandy loam in lower part.
- 44 to 56 inches +, white, very friable sandy loam.

Included in the areas mapped are small areas of other alluvial soils, including somewhat poorly drained Mantachie, Falaya, and Urbo soils and poorly drained Chastain soils.

These soils are strongly acid, low in natural fertility, and low in organic-matter content. The available water capacity is moderate to high. The infiltration rate is slow, and permeability is moderate to slow.

These soils are suited to almost all of the commonly grown pasture and forage crops. They are also suited to some hardwoods and to some row crops. Excess water is a serious limitation that must be considered when cropping systems are planned. A complete water-disposal system is needed, including properly arranged crop rows, V-type and W-type ditches, and field laterals. *Capability unit IVw-1; woodland group 8.*

Wilcox Series

Wilcox soils are somewhat poorly drained upland soils on middle and lower side slopes of more than 8 percent. These soils formed in acid, fine-textured Coastal Plain material.

These soils are in the western two thirds of the county. They are adjacent to and similar to Cuthbert, Dulac, Falkner, and Providence soils. They are more poorly drained and are finer textured throughout the profile than Dulac and Providence soils. They are more clayey in the upper part of the subsoil than Falkner soils. They are more poorly drained than Cuthbert soils and have more uniform color and texture in the subsoil.

Wilcox soils are low in organic-matter content, low in natural fertility, and strongly acid. The root zone is shallow. Permeability and the infiltration rate are slow. The available water capacity is moderate to high.

If well managed, Wilcox soils can be used for pasture. Most of the acreage is woodland.

In Tippah County, the Wilcox soils on strong slopes are mapped as part of a complex with Dulac soils. Those on steep and very steep slopes are mapped as part of a soil association with Cuthbert soils.

Wilcox-Cuthbert association, moderately steep (WcE).—This association consists of large areas of somewhat poorly drained Wilcox soils and moderately well drained Cuthbert soils, generally in about the same pattern and proportion. Wilcox soils are generally on the middle and lower slopes and cover about 58 percent of the association. Cuthbert soils and small included areas of Ruston and Shubuta soils, which make up the rest of the association, are on narrow ridgetops and upper side slopes.

The landscape is one of narrow, winding ridgetops and steep side slopes dissected by many narrow drains and draws. The slope range is 12 to 17 percent.

The Wilcox soils in this association are somewhat poorly drained. They formed in beds of acid clay shale of the Coastal Plain. The main layers of a typical profile are—

0 to 6 inches, dark-brown, friable silt loam.
6 to 30 inches, yellowish red, plastic clay distinctly mottled with shades of gray and brown; lower part is light brownish gray mottled with shades of brown and red.
30 to 40 inches +, gray, partially weathered clay shale.

Cuthbert soils are moderately well drained. These soils formed in acid, stratified, predominantly fine-textured Coastal Plain material. They are described under the heading "Cuthbert Series." The main layers of a typical profile are—

0 to 6 inches, yellowish-brown, very friable fine sandy loam; upper part is dark gray.
6 to 25 inches, yellowish red to strong-brown, plastic clay mottled with shades of brown in lower part.
25 to 58 inches +, strong-brown to olive-gray, plastic sandy clay mottled with shades of gray, red, and brown.

These soils are strongly acid, low in natural fertility, and low in organic-matter content. Permeability and the infiltration rate are slow. The available water capacity is moderate to high.

Because of the steep slopes, the erosion hazard is severe. It is not practical to grow row crops on these soils. The soils respond well to applications of lime and fertilizer, however, and if well managed can be used for pasture. *Wilcox soils: Subclass VIIe (no unit classification); woodland group 10. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 10.*

Wilcox-Cuthbert association, moderately steep, severely eroded (WcE3).—This association consists of large areas of somewhat poorly drained Wilcox soils and moderately well drained Cuthbert soils, generally in about the same pattern and proportion. Wilcox soils are on the middle and lower slopes and cover about 58 percent of the association. Cuthbert soils and small included areas of other soils, which make up the rest of the association, are on narrow ridgetops and upper side slopes.

The landscape is one of narrow, winding ridgetops and steep side slopes. The slope range is 12 to 17 percent.

The Wilcox soils in this association are somewhat poorly drained. They formed in beds of acid clay shale of the Coastal Plain. Practically all of the original surface layer has been removed by erosion. The present surface layer consists predominantly of mottled clay material from the subsoil but includes scattered patches of dark brown silt loam, which are remnants of the original surface layer. The subsoil is distinctly mottled and clayey and grades into partially weathered Porters Creek gray clay shale. Ordinarily the shale is at a depth of about 24 inches, but in a few severely eroded areas, it is at the surface.

Cuthbert soils are moderately well drained and formed in unconsolidated beds of acid clay, clay loam, and sandy clay of the Coastal Plain. Practically all of the original surface layer of the Cuthbert soils in this association has been removed by erosion. The present surface layer consists predominantly of yellowish-red clayey material from the subsoil but includes scattered patches of the original surface layer of yellowish brown to dark-gray sandy loam. The material at a depth of about 19 inches is clay mottled with shades of brown, gray, and red.

Both soils in this association are severely eroded. The original surface layer is gone, and rills, shallow gullies, and a few deep gullies have formed.

This association is adjacent to or near Falkner, Dulac, Bude, and Providence soils.

The soils in this association are strongly acid, low in natural fertility, and low in organic-matter content. The available water capacity is moderate to high. The infiltration rate is slow, permeability is slow, and runoff is rapid.

Because of the steep slopes, the erosion hazard is severe. It is not practical to grow row crops. These soils respond well to applications of lime and fertilizer, however, and if well managed can be used for pasture.

Wilcox soils: Subclass VIIe (no unit classification); woodland group 10. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 10.

Wilcox-Cuthbert association, steep (WcF).—This association consists of large areas of somewhat poorly drained Wilcox soils and moderately well drained Cuthbert soils, generally in about the same pattern and proportion.

Wilcox soils are on the middle and lower slopes and cover about 58 percent of the association. Cuthbert soils and the included areas of Ruston and Shubuta soils, which make up the rest of the association, are on narrow ridgetops and upper side slopes.

The landscape is one of narrow, winding ridgetops and very steep side slopes dissected by many narrow drains and draws. The slope range is 17 to 45 percent.

The Wilcox soils in this association are somewhat poorly drained. They formed in beds of acid clay shales of the Coastal Plain. They ordinarily have a surface layer of dark-brown heavy silt loam about 6 inches thick over yellowish-red, plastic clay distinctly mottled with shades of gray and brown. The clay grades into partially weathered gray clay shale at a depth of about 24 inches. Inclusions make up about 10 to 15 percent of the Wilcox part of this association. They consist of a soil that has a surface layer of very dark gray loam and a subsoil of yellowish brown to dark brown silty clay. The subsoil is distinctly mottled with shades of yellow in the lower part. As much as 50 percent of it consists of clay shale fragments. Depth to the weathered clay shale is about 20 to 24 inches.

Cuthbert soils are moderately well drained. The surface layer consists of yellowish-brown, very friable sandy loam and is about 6 inches thick. The subsoil, which is only about 19 inches thick, is yellowish-red clay. The underlying material is strong-brown to olive-gray, plastic sandy clay mottled with shades of gray, red, and brown.

The soils in this association are strongly acid, low in natural fertility, and low in organic-matter content. The available water capacity is moderate to high. Permeability and the infiltration rate are slow, and runoff is very rapid. The erosion hazard is severe. *Wilcox soils: Subclass VIIe (no unit classification); woodland group 10. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 10.*

Wilcox-Cuthbert association, steep, severely eroded (WcF3).—This association consists of large areas of severely eroded, somewhat poorly drained Wilcox soils and severely eroded, moderately well drained Cuthbert soils, generally in about the same pattern and proportion. Wilcox soils are on the middle and lower slopes and cover about 58 percent of the association. Cuthbert soils and other small inclusions, which make up the rest of the association, are on narrow ridgetops and upper side slopes.

The landscape is one of narrow, winding ridgetops and very steep side slopes dissected by many narrow drains and draws. The slope range is 17 to 45 percent.

The Wilcox soils of this association are somewhat poorly drained. They formed in beds of acid clay shale of the Coastal Plain. Practically all of the original surface layer has been removed by erosion. The present surface layer consists predominantly of mottled clayey material from the subsoil but includes scattered patches of the original surface layer of dark brown silt loam. The subsoil is distinctly mottled and clayey and grades into partially weathered Porters Creek gray clay shale. In a few severely eroded areas the shale is exposed at the surface. In other areas it is at a depth of about 24 inches.

Cuthbert soils are moderately well drained. They formed in unconsolidated beds of acid clay, clay loam, and sandy clay of the Coastal Plain. Practically all of the original surface layer of the Cuthbert soils in this association has been removed by erosion. The surface layer now consists predominantly of yellowish red clayey material from the subsoil but includes scattered patches of the original surface layer of yellowish-brown to dark-gray sandy loam. The material at a depth of about 19 inches is mottled with shades of brown, gray, and red.

Both soils in this association are severely eroded. The original surface layer is gone, and rills, shallow gullies, and a few deep gullies have formed.

This mapping unit is adjacent to or near Falkner, Dulac, Bude, and Providence soils.

The soils in this association are strongly acid, low in natural fertility, and low in organic matter content. The available water capacity is moderate to high. Permeability is slow, the infiltration rate is slow, and runoff is very rapid.

Because of the steep slopes, the erosion hazard is severe. It is not practical to grow row crops on these soils. *Wilcox soils: Subclass VIIe (no unit classification); woodland group 10. Cuthbert soils: Subclass VIIe (no unit classification); woodland group 10.*

Use of Soils for Agriculture

Erosion is a problem on most of the upland and terrace soils in Tippah County. Where the slopes are not too strong, erosion can be controlled by such measures as terraces, vegetated waterways, stripcropping, contour cultivation, and management of crop residues, all of which decrease the velocity of runoff. If the erosion hazard is severe, permanent vegetation is needed. Excess water is a problem on most of the bottom-land soils. It can be controlled by water-disposal systems, floodwater-retarding structures, and erosion-control measures on the surrounding higher lying soils.

In this section general principles of soil management are discussed, the capability classification used by the Soil Conservation Service is explained, and the soils of Tippah County are grouped according to their suitability for crops. Also given in this section are estimated yields of the principal crops, under two levels of management, and the amounts and kinds of fertilizers necessary to obtain these yields.

Suggestions in this section are general. For advice about specific management of individual soils, consult the local staffs of the Agricultural Extension Service and the Soil Conservation Service at Ripley, Miss.

General Principles of Soil Management

The main purpose of a soil survey report is to help farmers and other landowners plan the proper use and management of different kinds of soils. Important prac-

tices used in managing the soils of Tippah County are discussed in the following paragraphs.

FERTILIZING AND LIMING.—Most of the soils in Tippah County are acid and have a low or moderate supply of plant nutrients. Acidity can be corrected by adding lime. Essential plant nutrients can be added to the soil by applying fertilizers. Many farmers apply enough fertilizer and lime to obtain fair to good yields of cultivated crops and good yields of improved pasture. In 1961, farmers of the county applied about 3,245 tons of ground limestone on about 3,245 acres, and about 13,138 tons of mixed fertilizer.

No suggestions as to specific amounts of lime and fertilizer are given in this report because the fertility needs of different crops and the plant nutrient levels of different kinds of soil vary.

Soil tests determine the acidity of the soil and the content of essential plant nutrients. Using the results of soil tests, agricultural workers can calculate the kinds and amounts of fertilizer and lime needed to grow each different crop.

MAINTAINING ORGANIC MATTER. A continuous supply of organic matter improves the infiltration rate and the tilth of the soil, helps the soil retain moisture and plant nutrients, and helps to reduce crusting and packing. Crop residues, cover crops, and green-manure crops are important sources of organic matter. Wild winter peas and vetch are the most important cover crops and green-manure crops currently grown. If worked into the soil, they not only add organic matter to the soils but also protect the soils from erosion.

DRAINAGE. Adequate drainage is necessary if crops are to be grown successfully on the areas of alluvial land and the flat or nearly level soils of the county. If adequately drained and fertilized, these poorly drained soils could be used more intensively for agriculture. Most pasture plants and many other crops grow satisfactorily on the somewhat poorly drained soils of the county, but artificial drainage and water disposal are generally needed for higher yields of improved pasture. If cultivated crops are grown, the rows should be designed so that they will carry excess water to the outlet, but the fall in each row should not be enough to cause erosion. V-type or W-type ditches in low areas generally remove any excess runoff. Field laterals, ditches, and canals must be kept clear of brush and trees to help reduce the danger of overflow. Diversion terraces are helpful in protecting low-lying areas from runoff from nearby hills.

CROPPING SYSTEMS AND TILLAGE.—Some of the soils of the county can be used for row crops year after year. Others are highly susceptible to erosion if row crops are grown. Different cropping systems are necessary, therefore, for the different kinds of soil.

Close-growing crops and soil improving crops in the cropping system maintain and increase the supply of organic matter. Crop residues, such as corn or cotton stalks, should be shredded and left on the surface as a mulch.

Tillage should follow the contour fairly closely. The fall of the rows should be steep enough so that excess water moves to an outlet, yet gentle enough so that it does not cause erosion. Plowpans can be broken by chiseling when the soil is dry. Lime and complete fertilizers are needed to insure high yields of row crops and improved pasture.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe 1 or IIIe-2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil, and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows.

Class I. Soils that have few limitations that restrict their use. (No subclasses) None in Tippah County.

Class II. Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe. Soils subject to moderate erosion if they are not protected.

Unit IIe-1.—Well-drained, gently sloping, thin loessal soils of the uplands; eroded.

Unit IIe 2. Moderately well drained, gently sloping, thin loessal soils of the uplands; eroded; fragipan.

Subclass IIw. Soils that have moderate limitations because of excess water.

Unit IIw-1.—Moderately well drained, dominantly coarse-textured alluvial soils.

Unit IIw-2.—Moderately well drained, dominantly medium-textured loessal alluvial soils.

Unit IIw-3.—Somewhat poorly drained, dominantly medium textured loessal alluvial soils.

Unit IIw 4. Somewhat poorly drained, dominantly coarse-textured alluvial soils.

Class III. Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.

Unit IIIe-1.—Well-drained, gently sloping and sloping, thin loessal soils of the uplands; severely eroded.

Unit IIIe-2.—Moderately well drained, gently sloping, thin loessal soils of the uplands; eroded and severely eroded; fragipan.

Unit IIIe-3. Somewhat poorly drained, sloping, thin loessal soils of the uplands; eroded.

Subclass IIIw. Soils that have severe limitations because of excess water.

Unit IIIw-1.—Somewhat poorly drained, nearly level and gently sloping soils; brittle and compact fragipan or clay layer in lower part of subsoil.

Unit IIIw 2.—Poorly drained, nearly level soils; brittle and compact fragipan or heavy clay layer in lower part of subsoil.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe-1.—Well-drained, strongly sloping, thin loessal soils of the uplands; severely eroded.

Unit IVe-2.—Moderately well drained, sloping soils of the uplands; severely eroded; brittle and compact fragipan.

Unit IVe-3.—Somewhat poorly drained, gently sloping and sloping, thin loessal soils of the uplands; severely eroded; mottled, plastic clay in lower part of subsoil.

Subclass IVw. Soils that have very severe limitations for cultivation, because of excess water.

Unit IVw-1.—Poorly drained alluvial soils.

Class V. Soils that are not likely to erode but have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass Vw. Soils too wet for cultivation; drainage or protection not feasible.

Unit Vw-1.—Somewhat poorly drained and moderately well drained, dominantly coarse-textured alluvium or well-stratified deposits of coarse-textured and medium-textured alluvium; subject to frequent overflow.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe. Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Unit VIe-1.—Moderately well drained, strongly sloping, thin loessal soils of the uplands; severely eroded; brittle and compact fragipan.

Unit VIe-2.—Well-drained, moderately steep upland soils; slight to moderate erosion.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Unit VIIe-1.—Well-drained, steep, sandy upland soils.

Unit VIIe 2. Coarse-textured to fine-textured soil material; severely eroded; mostly intricate patterns of gullies.

Class VIII. Soils and landforms that have limitations that preclude their use, without major reclamation, for commercial production of plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes. None in Tippah County.

Management by Capability Units

A description of each capability unit is given in the following pages. Each description lists the soils in that unit and gives their proportionate extent. It also describes the characteristics and qualities of the soils, their present use, their suitability for crops, the major limitations and hazards, and effective management practices.

One land type and the soils mapped in complexes and associations were not assigned to a capability unit. They were placed only in subclasses and are described under their respective subclass headings.

Capability unit IIe-1

Atwood silt loam, 2 to 5 percent slopes, eroded, is the only soil in this unit. It is a thin loessal soil of the uplands. The surface layer is dark reddish-brown, friable silt loam, and the subsoil is yellowish-red, friable silty clay loam.

This soil is well drained. Plant roots penetrate it easily, and the root zone is deep. Water is absorbed slowly. Permeability is moderate in both the surface layer and the subsoil. The available water capacity is high, and crops growing on this soil easily withstand the effects of short droughts.

This soil is easy to cultivate, but it crusts and packs readily. It is moderate in natural fertility, low in or-

ganic-matter content, and strongly acid. It responds well to applications of lime and fertilizer.

This soil occupies less than 1 percent of the county. Most of it is in row crops and pasture.

If high-level management is practiced, good yields of crops, pasture plants, and pine trees can be obtained. Cotton, corn, soybeans, grain sorghum, small grain, Coastal bermudagrass, common bermudagrass, tall fescue, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, vetch, sudangrass, and pine trees are well suited.

Terraces, grassed waterways, and contour tillage reduce runoff and help to control erosion. If the soil is protected by such measures, clean-tilled crops can be grown continuously. If the soil is not protected, it should be kept in close growing crops about half the time. A suitable cropping system consists of 2 years of small grain and lespedeza, then 2 years of row crops.

Capability unit IIe-2

This unit consists of gently sloping, moderately well drained soils that have a mottled, brittle, compact fragipan at a depth of about 2 feet. These are eroded, thin loessal soils of the uplands. The surface layer is brown, friable silt loam, and the subsoil is brown or yellowish-red silty clay loam. These soils are—

Dulac silt loam, 2 to 5 percent slopes, eroded.
Freeland silt loam, 2 to 5 percent slopes, eroded.
Ora silt loam, 2 to 5 percent slopes, eroded.
Providence silt loam, 2 to 5 percent slopes, eroded.

Plant roots easily penetrate as far down as the fragipan, but they are restricted in the pan. Because the root zone is largely in the uppermost 2 feet, these soils are slightly droughty in dry summers. Water moves slowly through the fragipan and clayey layers, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate.

These soils are easy to cultivate, but they crust and pack when bare. They are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils occupy less than 1 percent of the county. Most of the acreage is in row crops and pasture.

If high-level management is practiced, good yields of crops, pasture plants, and pine trees can be obtained. Cotton, corn, soybeans, grain sorghum, small grain, Coastal bermudagrass, common bermudagrass, dallisgrass, johnsongrass, bahiagrass, tall fescue, wild winter peas, vetch, annual lespedeza, sericea lespedeza, crimson clover, white clover, sudangrass, and pine trees are well suited.

Terraces, grassed waterways, and contour tillage reduce runoff and help to control erosion. If the soils are protected by such measures, clean-tilled crops can be grown continuously. If the soils are not protected, they should be kept in close-growing crops about half the time. A suitable cropping system consists of 2 years of oats and lespedeza, then 2 years of row crops.

Capability unit IIw-1

This unit consists of dominantly coarse-textured alluvial soils that are nearly level and moderately well drained and have a mottled layer beginning at a depth of about 2 feet. The surface layer is ordinarily dark-brown sandy loam, and the upper part of the subsoil is dark yellowish-brown loam. These soils are—

Iuka soils.
Iuka soils, local alluvium

Plant roots easily penetrate the surface layer and the upper part of the subsoil, but they are somewhat restricted in the mottled layer. The water table rises into the mottled layer during the rainy seasons, particularly in winter and early in spring. The infiltration rate is moderate, permeability is moderate, and the available water capacity is moderate.

These soils are easy to cultivate, but they crust and pack easily. They are moderate in natural fertility, low in organic matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils occupy less than 1 percent of the county. Most of the acreage is in row crops and pasture.

If high-level management is practiced, good yields can be obtained. Cotton, corn, soybeans, grain sorghum, small grain, bermudagrass, tall fescue, dallisgrass, bahiagrass, sudangrass, wild winter peas, vetch, annual lespedeza, white clover, crimson clover, pine trees, and some hardwoods are suitable.

Crops generally are moderately damaged by flooding. Also, the removal of surface water is likely to be a problem. An adequate water-disposal system is needed. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. V-type and W-type ditches and field laterals may also be needed. Diversion terraces are effective in preventing water that runs off the hillsides from flowing across these bottomland soils.

Capability unit IIw-2

This unit consists of dominantly medium-textured, loessal alluvial soils that are nearly level and moderately well drained and have a mottled layer beginning at a depth of about 1½ feet. The surface layer is brown, and the upper part of the subsoil is ordinarily dark yellowish brown. Both layers are friable silt loam. Below a depth of about 1½ feet, light brownish-gray and pale-brown mottles are common. These soils are—

Collins silt loam.
Collins silt loam, local alluvium.

Plant roots easily penetrate the surface layer and the upper part of the subsoil, but they are restricted in the mottled layer. The water table rises into the mottled layer during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate to high.

These soils are easy to cultivate, but they crust and pack. They are moderate in natural fertility, low in organic-matter content, and very strongly acid. They respond well to applications of lime and fertilizer.

These soils occupy less than 1 percent of the county. Most of the acreage is in row crops and pasture.

If high-level management is practiced, good yields of crops and pasture plants can be obtained. Cotton, corn, soybeans, grain sorghum, small grain, all grasses, all legumes, pine trees, and some hardwoods are well suited.

The removal of surface water is likely to be a problem. Crop rows should be designed so that each row will carry

excess water to a properly constructed outlet. V-type and W-type ditches and field laterals may also be needed. Diversion terraces are effective in preventing water that runs off the hillsides from flowing across these bottom-land soils.

Capability unit IIw-3

This unit consists of dominantly medium-textured, loessal alluvial soils that are nearly level and somewhat poorly drained and have a mottled layer at a depth of about 7 inches. The surface layer is dark-brown silt loam. The subsoil is ordinarily brown silt loam mottled with light gray, gray, and yellowish brown. These soils are—

Falaya silt loam.
Falaya silt loam, local alluvium.

Plant roots easily penetrate the surface layer, but they are somewhat restricted in the mottled subsoil because of a high water table. The water table rises into the subsoil during the rainy seasons, particularly in winter and early in spring. The available water capacity is high.

These soils are easy to cultivate, but they crust and pack easily. They are moderate in natural fertility, low in organic-matter content, and very strongly acid. They respond well to applications of lime and fertilizer.

These soils occupy more than 9 percent of the county. Most of the acreage is in row crops and pasture.

If high-level management is practiced, good yields of most crops can be obtained. These soils are well suited to corn (fig. 8). They are also suited to cotton, soybeans, grain sorghum, and small grain, except barley; to Coastal bermudagrass, tall fescue, dallisgrass, johnsongrass, bahiagrass, wild winter peas, vetch, lespedeza, red clover, and white clover; and to some hardwoods. They are poorly suited to alfalfa, sericea lespedeza, and sweetclover.

Crops generally are moderately damaged by flooding. Also, the removal of surface water is likely to be a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. V-type and W-type ditches and field laterals may also be needed. Diversion terraces are effective in preventing water that runs off the hillsides from flowing across these bottom-land soils.

Capability unit IIw-4

This unit consists of dominantly coarse-textured alluvial soils that are somewhat poorly drained and have a mottled layer beginning at a depth of 10 to 12 inches. The surface layer is dark-brown, friable silt loam. The upper part of the subsoil is yellowish-brown loam, and the lower part contains grayish mottles. These soils are—

Mantachie soils.
Mantachie soils, local alluvium.
Urbo silty clay loam.

Plant roots easily penetrate the surface layer and the upper part of the subsoil, but they are somewhat restricted in the mottled layer because of a high water table. The water table rises into the mottled layer during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate to high.

These soils are easy to cultivate, but they crust and pack. They are moderate in natural fertility, low in organic-matter content, and very strongly acid. They respond well to applications of lime and fertilizer.

Figure 8.—Irrigated corn on Falaya silt loam.

These soils make up more than 3 percent of the county. Most of the acreage is in row crops or pasture.

If high-level management is practiced, good yields of the commonly grown crops can be obtained. Cotton, corn, soybeans, grain sorghum, bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, annual lespedeza, red clover, white clover, ladino clover, pine trees, and some hardwoods are suited.

Crops generally are moderately damaged by flooding. Also, the removal of surface water is likely to be a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. V-type and W-type ditches and field laterals are generally needed. Diversion terraces are effective in preventing water that runs off the hillsides from flowing across these bottom-land soils.

Capability unit IIIe-1

This unit consists of thin loessal upland soils that are well drained, gently sloping and sloping, and severely eroded. Ordinarily the surface layer is reddish-brown, friable silt loam, and the subsoil is yellowish-red silty clay loam. These soils are—

Atwood silt loam, 2 to 5 percent slopes, severely eroded.
Atwood silt loam, 5 to 8 percent slopes, severely eroded.

Plant roots penetrate these soils easily, and the root zone is deep. The infiltration rate is slow. Permeability of the surface layer and the subsoil is moderate. The available water capacity is high.

These soils are easy to cultivate, but they crust and pack easily. They are high in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils make up less than 1 percent of the county. Most of the acreage is in row crops or pasture.

If good management is practiced, moderate yields of crops and pasture plants can be obtained. These soils are suited to cotton, corn, soybeans, grain sorghum, and small grain; to Coastal bermudagrass, common bermudagrass, dallisgrass, johnsongrass, bahiagrass, tall fescue, sudangrass, wild winter peas, vetch, alfalfa, annual lespedeza, sericea lespedeza, red clover, white clover, and crimson clover; and to peach and pine trees.

The erosion hazard is severe. Suitable cropping systems and adequate water control measures reduce runoff and help to control erosion. If the soils are protected by such measures, row crops can be grown about half of the time; for example, 2 years of row crops, then 2 years of close-growing crops. If the soils are not protected, they should be kept predominantly in close-growing crops. A suitable cropping system consists of 4 years of pasture plants and then 2 years of row crops.

Capability unit IIIe–2

This unit consists of gently sloping, moderately well drained soils that have a mottled, brittle, compact fragipan at a depth of about 2 feet. These are eroded and severely eroded, thin loessal soils of the uplands. The surface layer is brown, friable silt loam, and the subsoil is strong-brown or yellowish-red silty clay loam. These soils are—

- Dulac silt loam, 2 to 5 percent slopes, severely eroded.
- Ora loam, 2 to 5 percent slopes, severely eroded.
- Ora silt loam, 5 to 8 percent slopes, eroded.
- Providence silt loam, 2 to 5 percent slopes, severely eroded.
- Providence silt loam, 5 to 8 percent slopes, eroded.

Plant roots easily penetrate as far down as the fragipan, but they are restricted in the pan. Because the root zone is largely in the uppermost 2 feet, these soils are slightly droughty in dry summers. Water moves slowly through the fragipan, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate.

These soils are easy to cultivate, but they crust and pack easily. They are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils make up more than 1 percent of the county. Most of the acreage is in row crops or pasture.

If high-level management is practiced, good yields of all crops and pasture plants can be obtained. Cotton, corn, soybeans, grain sorghum, small grain, Coastal bermudagrass, common bermudagrass, fescue, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, vetch, white clover, sudangrass, and pine trees are well suited.

The erosion hazard is severe. Terraces, sodded waterways, and contour tillage reduce runoff and help to control erosion. If the soils are protected by such measures, row crops can be grown about half of the time; for example, 2 years of row crops, then 2 years of small grain and lespedeza. If the soils are not protected, they should be kept predominantly in close-growing crops. A suitable cropping system consists of 4 years of sod and then 2 years of row crops.

Capability unit IIIe–3

Falkner silt loam, 5 to 8 percent slopes, eroded, is the only soil in this unit. It is a somewhat poorly drained, thin loessal soil of the uplands. The surface layer is brown, friable silt loam, and the subsoil is yellowish-brown, friable silty clay loam. Below a depth of about 2 feet is very plastic, sticky clay.

Plant roots easily penetrate as far down as the clay layer, but they are restricted in this layer. Because the root zone is largely in the uppermost 2 feet, this soil is slightly droughty in dry summers. Water moves slowly through the clay layer, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate to low.

This soil is easy to cultivate, but it crusts and packs easily. It is moderate in natural fertility, low in organic-matter content, and strongly acid. It responds well to applications of lime and fertilizer.

This soil makes up less than 1 percent of the county. Most of it is in woodland or pasture.

If well managed, this soil is moderately productive of corn and small grain; of Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and white clover; and of pine trees and some hardwoods.

The erosion hazard is severe. Terraces, sodded waterways, and contour tillage reduce runoff and help to control erosion. If the soil is protected by such measures, row crops can be grown about half of the time; for example, 2 years of row crops, then 2 years of oats and lespedeza. If the soil is not protected, it should be kept predominantly in close-growing crops. A suitable cropping system consists of 4 years of sod and then 2 years of row crops.

Capability unit IIIw–1

This unit consists of somewhat poorly drained, nearly level and gently sloping soils that have a brittle and compact fragipan or a clay layer at a depth of about 1½ to 2 feet. The surface layer is brown silt loam, and the subsoil is yellowish-brown silt loam or silty clay loam. These soils are—

- Bude silt loam, 0 to 2 percent slopes.
- Bude silt loam, 2 to 5 percent slopes.
- Bude silt loam, 2 to 5 percent slopes, eroded.
- Falkner silt loam, 0 to 2 percent slopes.
- Falkner silt loam, 2 to 5 percent slopes, eroded.
- Hatchie silt loam, 0 to 2 percent slopes.
- Hatchie silt loam, 2 to 5 percent slopes.

Plant roots easily penetrate as far down as the fragipan or clay layer, but they are restricted within these layers. Because the root zone is largely in the upper most 1½ feet, these soils are slightly droughty in dry summers. Water moves slowly through the pan or clay layer, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring.

These soils are easy to cultivate, but they crust and pack easily. They are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils cover almost 3 percent of the county. Most of the acreage is in row crops or pasture.

If high-level management is practiced, moderate yields of the commonly grown crops and pasture plants can be obtained. These soils are suited to corn, small grain, and soybeans; to Coastal bermudagrass, common bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and white clover; and to pine trees and some hardwoods.

The removal of surface water is a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. Surface

field ditches may also be needed. Diversion terraces are effective in preventing water that runs off the nearby hillsides from flowing across these soils. If the soils are adequately drained, row crops can be grown continuously. If the soils are not adequately drained, they should be kept predominantly in close-growing crops. A suitable cropping system consists of 4 years of sod and then 2 years of row crops.

Capability unit IIIw–2

This unit consists of poorly drained, nearly level soils that have either a mottled, brittle, compact fragipan or a heavy clay layer at a depth of about 2 feet. The surface layer is brown silt loam, and the subsoil is gray silt loam or silty clay loam. These soils are—

Almo silt loam.
Tickfaw silt loam.

Plant roots easily penetrate the surface layer and the upper part of the subsoil but are restricted in the lower part of the subsoil as well as in the fragipan or heavy clay layer. Because the root zone is largely in the uppermost 12 inches, these soils are droughty in dry summers. Water moves slowly through the fragipan or clay layer, and consequently the soils tend to become waterlogged to the surface during the rainy seasons, particularly in winter and early in spring. The available water capacity is low to moderate.

These soils crust and pack easily. They are low to moderate in natural fertility, low to moderate in organic-matter content, and strongly acid. They show moderate response to applications of lime and fertilizer.

These soils make up less than 1 percent of the county.

If high-level management is practiced, moderate yields of grass and hay crops can be obtained. These soils are suited to Coastal bermudagrass, common bermudagrass, tall fescue, dallisgrass, bahiagrass, annual lespedeza, and white clover, and to some hardwoods.

The removal of surface water is a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. Surface field ditches may also be needed. Diversion terraces are effective in preventing water that runs off the nearby hillsides from flowing across these soils. If the soils are adequately drained, row crops can be grown continuously. If the soils are not adequately drained, they should be kept predominantly in close-growing crops. A suitable cropping system consists of 4 years of sod and then 2 years of row crops.

Capability unit IVe–1

Atwood silt loam, 8 to 12 percent slopes, severely eroded, is the only soil in this unit. It is a well drained, thin loessal soil of the uplands. Ordinarily the surface layer is reddish-brown, friable silt loam, and the subsoil is yellowish-red silty clay loam.

Plant roots easily penetrate this soil. The rate of infiltration is slow, but permeability is moderate. Because of the moderately steep slopes, rainfall during the growing season runs off instead of soaking in. For this reason, the soil is slightly droughty, even though its available water capacity is moderate to high.

This soil is high in natural fertility, low in organic-matter content, and strongly acid. It responds well to applications of lime and fertilizer.

This soil makes up less than 1 percent of the county. Most of it is in row crops or pasture.

This soil is suited to row crops, pasture plants, and pine trees, but because of the slope and the erosion hazard, it is best suited to pasture plants and trees.

If high-level management is practiced, this soil is moderately productive of cotton, corn, soybeans, grain sorghum, and small grain; of Coastal bermudagrass, common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, sudangrass, wild winter peas, vetch, alfalfa, common lespedeza, sericea lespedeza, red clover, white clover, and crimson clover; and of peach and pine trees.

The erosion hazard is severe. Terraces, sodded waterways, and contour tillage reduce runoff and help to control erosion. Even if protected by such measures, this soil should be kept predominantly in perennial vegetation. A suitable cropping system consists of 6 years of sod, then 2 years of row crops. If the soil is not protected, perennial vegetation should be grown continuously.

Capability unit IVe–2

This unit consists of sloping, severely eroded, moderately well drained upland soils that have a mottled, brittle, compact fragipan at a depth of about 2 feet. The surface layer is dark yellowish-brown, friable silt loam, and the subsoil is brown or yellowish-red silty clay loam or heavy loam. These soils are—

Dulac silt loam, 5 to 8 percent slopes, severely eroded.
Ora loam, 5 to 8 percent slopes, severely eroded.
Providence silt loam, 5 to 8 percent slopes, severely eroded.

Plant roots easily penetrate these soils above the fragipan, but they are greatly restricted in the pan. Because the root zone is largely in the uppermost 2 feet, these soils are slightly droughty in dry summers. Water moves slowly through the fragipan, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring.

These soils are easy to cultivate, but they crust and pack when bare. They are strongly acid and respond well to applications of lime and fertilizer.

These soils make up more than 6 percent of the county.

If well managed, these soils are moderately productive of most commonly grown crops and pasture plants. Cotton, corn, soybeans, grain sorghum, small grain, Coastal bermudagrass, common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, white clover, sudangrass, and pine trees are well suited.

The erosion hazard is severe. Terraces, sodded waterways, and contour tillage reduce runoff and help to control erosion. Even if protected by such measures, these soils should be kept predominantly in perennial vegetation. A suitable cropping system consists of 6 years of sod, then 2 years of row crops. If the soils are not protected, perennial vegetation should be grown continuously.

Capability unit IVe–3

This unit consists of somewhat poorly drained, severely eroded, gently sloping and sloping soils. These are thin loessal soils of the uplands. The surface layer is brown silt loam, and the upper part of the subsoil is yellowish-brown silty clay loam. Below a depth of about 2 feet is mottled, gray, plastic clay. These soils are—

Falkner silt loam, 2 to 5 percent slopes, severely eroded.
Falkner silt loam, 5 to 8 percent slopes, severely eroded.

Plant roots easily penetrate these soils as far down as the clay layer, but they are restricted within this layer. Because the root zone is largely in the uppermost 2 feet, these soils are slightly droughty in dry summers. Water moves slowly through the clay layer, and the subsoil tends to become waterlogged during the rainy seasons, particularly in winter and early in spring. The available water capacity is moderate to low.

These soils are easy to cultivate, but they crust and pack readily. They are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils make up about 1 percent of the county. Most of the acreage is in row crops or pasture.

These soils are suited to row crops, pasture plants, or trees. Because they are highly susceptible to erosion, they are best suited to pasture plants or trees. Corn, small grain, Coastal bermudagrass, common bermudagrass, fescue, dallisgrass, wild winter peas, vetch, annual lespedeza, white clover, and pine trees will grow. The soils are poorly suited to cotton, soybeans, grain sorghum, sericea lespedeza, and crimson clover.

Terraces, sodded waterways, and contour tillage reduce runoff and help to control erosion. Even though the soils are protected by such measures, they should be kept predominantly in perennial vegetation. A suitable cropping system consists of 6 years of sod, then 2 years of row crops. If the soils are not protected, perennial vegetation should be grown continuously.

Soils of subclass IVe not placed in a capability unit

The Dulac soils in Dulac-Wilcox complex, 8 to 12 percent slopes, and in Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded, are in subclass IVe but are not assigned to a capability unit. Dulac soils are on the ridgetops and on the upper part of slopes. They are moderately well drained and have a fragipan at a depth of about 23 to 40 inches. The surface layer is dark brown, friable silt loam, and the subsoil is brown or dark-brown silty clay loam. Beneath the fragipan is mottled gray and dark-red clay.

In eroded areas most of the surface layer has been removed, and some gullies have formed. Permeability is moderate in the upper part of the subsoil and slow in the fragipan and underlying clay. The available water capacity is moderate.

Dulac soils are moderate or low in natural fertility and very strongly acid. They respond well to applications of lime and fertilizer.

Most of the acreage is wooded; the rest is used as pasture. Dulac soils are suited to pine trees and to bermudagrass, bahiagrass, annual lespedeza, sericea lespedeza, and crimson clover.

The erosion hazard is severe. Maintaining a cover crop helps to control erosion. The woodland should be protected from fire. Pastures should be limed and fertilized and protected against overgrazing. Proper management is more difficult on the severely eroded soils because of the less favorable structure and consistence of the surface layer.

Capability unit IVw–1

This unit consists of poorly drained alluvial soils. The surface layer is brown, friable loam or silt loam, and the subsoil is gray loam or silty clay loam mottled with shades of brown and yellow. These soils are—

Chastain soils
Waverly and Bibb soils.

Plant roots penetrate easily as far down as the water table but are restricted below it. Excess surface water and the high water table usually delay the planting of row crops. The available water capacity is moderate to low.

These soils are easy to cultivate but tend to crust and pack easily. They are low in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils cover about 3 percent of the county. Most of the acreage is forested.

If high-level management is practiced, good yields can be obtained of Coastal bermudagrass, common bermudagrass, tall fescue, dallisgrass, bahiagrass, annual lespedeza, and white clover, and of some hardwoods.

Crops generally are severely damaged by flooding. Also, the removal of surface water is a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. V-type and W-type ditches and field laterals are generally needed. Diversion terraces are effective in preventing water that runs off the hillsides from flowing across these soils.

Land type of subclass IVw not placed in a capability unit

In subclass IVw, but not assigned to a capability unit, is Mixed alluvial land, a land type that contains several different kinds of moderately well drained or somewhat poorly drained soils . It consists of alluvial deposits made up of well-stratified beds of silt, sand, and loam. Irregularities of the surface are common.

Because of the high content of sand and the stratification in the surface layer and upper part of the subsoil, this land type is slightly droughty in dry summers. The available water capacity is variable. The thickness of the root zone varies from place to place.

This land type is low in natural fertility, low in organic-matter content, and medium acid or strongly acid. It generally responds well to applications of lime and fertilizer.

Mixed alluvial land occupies a little more than 1 percent of the county. Most of the acreage is in row crops or pasture.

If high-level management is practiced, good yields of the commonly grown row crops, pasture plants, and trees can be obtained. This land type is suited to cotton, corn,

soybeans, and small grain; to common bermudagrass, bahiagrass, and annual lespedeza; and to pine trees and some hardwoods.

Flooding generally causes moderately severe damage to crops. Also, the removal of surface water is likely to be a problem. Crop rows should be designed so that each row will carry excess water to a properly constructed outlet. V-type and W-type ditches may also be needed. If adequate drainage is provided, row crops can be grown continuously. Without drainage, yields are likely to be low.

Capability unit Vw–1

This unit is made up of two soils and one land type, all of which are acid, somewhat poorly drained or moderately well drained, and subject to frequent overflow. They are—

Falaya silt loam, overflow.
Mantachie soils, overflow.
Mixed alluvial land, overflow.

The Falaya soil has a subsurface layer of grayish-brown to light brownish-gray, friable silt loam mottled with shades of gray and brown. The lower part of its profile is gray, friable heavy silt loam distinctly mottled with shades of brown. Mantachie soils have a surface layer of dark-brown, friable silt loam, a subsurface layer of yellowish-brown loam, and grayish mottles 10 or 12 inches below the surface. Mixed alluvial land consists of well-stratified beds of silt, sand, and loam. Surface irregularities are common.

This unit occupies a little more than 1 percent of the county. Most of the acreage is forested.

It is feasible to plant row crops only if the flood hazard is reduced. V-type and W-type ditches, field laterals, and other water-control measures help to reduce the likelihood of flooding. If these soils are protected by such measures, they are suited to cotton, corn, soybeans, and grain sorghum; to common bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, annual lespedeza, red clover, white clover, and ladino clover; and to pine trees and some hardwoods. If these soils are not protected, they should be in pine trees and suitable hardwoods.

Capability unit VIe–1

This unit consists of strongly sloping, severely eroded soils that are moderately well drained and have a mottled, brittle, compact fragipan at a depth of about 20 inches. These are thin loessal soils of the uplands. The surface layer is brown silt loam or loam, and the subsoil is yellowish-red silty clay loam or heavy loam. These soils are—

Ora loam, 8 to 12 percent slopes, severely eroded.
Providence silt loam, 8 to 12 percent slopes, severely eroded.

Plant roots easily penetrate the surface layer and the upper part of the subsoil, but they are restricted in the fragipan. Because the root zone is largely in the uppermost 20 inches, these soils are slightly droughty in dry summers. Water moves slowly through the fragipan. The available water capacity is moderate.

These soils are easy to cultivate, but they crust and pack easily. They are moderate in natural fertility, low in organic-matter content, and strongly acid. They respond well to applications of lime and fertilizer.

These soils occupy almost 2 percent of the county. Most of the acreage has been in row crops or pasture, but much of it is being planted to loblolly pine.

These soils are well suited to common bermudagrass, bahiagrass, wild winter peas, annual lespedeza, sericea lespedeza, and crimson clover, and to pine trees. Because of the severe erosion hazard, they should be kept in perennial vegetation, such as sod or trees. The woodlands should be protected from fire. Pastures should be fertilized and limed and protected against overgrazing.

Capability unit VIe–2

This unit consists of moderately steep, well-drained upland soils. The texture of the surface layer varies. In uneroded areas the surface layer is sandy loam. The upper part of the subsoil is yellowish-red sandy clay loam, and the lower part is yellowish-red sandy loam. These soils are—

Ruston soils, 12 to 17 percent slopes.
Ruston soils, 12 to 17 percent slopes, eroded.
Ruston soils in Ruston Cuthbert association, moderately steep.

The root zone is deep. Permeability is moderate to rapid. The moisture-holding capacity is moderate. Natural fertility is moderate, and the organic-matter content is low.

These soils make up a little more than 1 percent of the county.

If well managed, these soils are moderately productive of common bermudagrass, dallisgrass, bahiagrass, sudangrass, millet, wild winter peas, vetch, lespedeza, and crimson clover, and of fruit and pine trees. They are highly susceptible to erosion and should be protected by permanent vegetation.

Capability unit VIIe–1

This unit consists of well-drained, steep, sandy upland soils. In uneroded areas the surface layer is brown sandy loam or loamy sand. The upper part of the subsoil is red sandy clay loam, and the lower part is red sandy loam. These soils are—

Ruston soils, 17 to 45 percent slopes.
Ruston soils in Ruston-Cuthbert association, moderately steep, eroded.
Ruston soils in Ruston-Cuthbert-Shubuta association, moderately steep, eroded.

Plant roots easily penetrate these soils, and the root zone is deep. The available moisture capacity is moderate. Natural fertility is low, and the organic-matter content is low.

These soils cover more than 9 percent of the county. Most of the acreage is in woodland and pasture.

Ruston soils are well suited to some species of trees. They are highly susceptible to erosion and need a permanent vegetative cover. The woodlands should be protected from fire and the pastures from overgrazing.

Capability unit VIIe–2

This unit consists of land types so severely eroded that they are mostly intricate patterns of gullies. The original soil has been washed away, except for small areas between the gullies. The soil material is acid. Runoff

is rapid and the available water capacity is commonly low. These land types are—

Gullied land, clayey.
Gullied land, sandy.

These two land types make up more than 34 percent of the county. Most of the acreage is in woodland.

These areas are suited to pine trees. A well-managed stand is needed to stabilize the soil material and thus reduce the hazards of further erosion and of deposition of sediments on lower lying areas. There should be protection against fire and harmful grazing.

Soils of subclass VIIe not placed in a capability unit

Following are soils, mapped in complexes and associations, that are classified in subclass VIIe but are not assigned to a capability unit.

Cuthbert soils in Ruston-Cuthbert association, moderately steep.
Cuthbert soils in Ruston-Cuthbert association, moderately steep, eroded.
Cuthbert and Shubuta soils in Ruston-Cuthbert-Shubuta association, moderately steep, eroded.
Ruston-Cuthbert association, steep.
Ruston-Cuthbert-Shubuta association, steep.
Wilcox soils in Dulac-Wilcox complex, 8 to 12 percent slopes.
Wilcox soils in Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded.
Wilcox-Cuthbert association, moderately steep.
Wilcox-Cuthbert association, moderately steep, severely eroded.
Wilcox-Cuthbert association, steep.
Wilcox Cuthbert association, steep, severely eroded.

The Cuthbert soils in these associations are moderately well drained, clayey soils that have a moderately shallow root zone. The surface layer is friable sandy loam. The subsoil is yellowish-red to strong-brown, plastic clay that is mottled with brown. Below a depth of about 25 inches is strong-brown to olive-gray, plastic sandy clay that is mottled with gray, red, and brown.

The Ruston soils in these associations are deep and well drained and have a friable sandy surface layer that is about 16 inches thick. The subsoil is red, friable sandy clay loam. It extends to a depth of about 45 inches. Beneath this is red, friable sandy loam, which extends to a depth of more than 70 inches.

The Shubuta soils in these associations are moderately well drained and have a moderately deep root zone. The surface layer in eroded areas is friable loam and is about 6 inches thick. The subsoil is yellowish-red clay loam mottled with brown. The underlying material is strong-brown clay loam mottled with red.

The Wilcox soils are somewhat poorly drained and have a shallow root zone. The surface layer, if it is not eroded, is friable silt loam and is about 6 inches thick. The subsoil is yellowish-red, plastic clay mottled with gray and brown. It is underlain by partly weathered, gray clay shale at a depth of about 30 inches. Wilcox soils are generally near the base and the middle of slopes.

All of these soils are strongly acid. Permeability is slow. The available water capacity ranges from moderate to high, but the infiltration rate is so slow that much of the rainwater runs off instead of soaking in.

Most of the acreage is in woodland, but some small areas are in pasture. The erosion hazard is severe if the soils are not protected by vegetation. Some of the slopes of less than 17 percent can be used for pasture, especially if they are in associations that contain Ruston soils. If well managed, all of these soils are moderately productive of bermudagrass, dallisgrass, bahiagrass, sudangrass, wild winter peas, vetch, lespedeza, and crimson clover. Pine trees can be grown on all the soils, and in some areas hardwoods can be grown successfully.

Estimated Yields

The soils of Tippah County vary considerably in productivity. Some consistently produce high yields of cultivated crops, and others are better suited to less intensive uses.

Estimates of yields of the principal crops, under two levels of management, are shown in table 2. The estimates are averages for a long period of time. In any given year, the yield of any crop may be more or less than the figure shown.

The estimates are based on data obtained by long-term experiments, on records of yields harvested on farms in cooperative soil productivity-management studies, and on information supplied by agronomists who have had much experience with crops in Tippah County.

The figures in the "A" columns are estimates of yields under common management; those in the "B" columns are estimates of yields under improved management but are not presumed to represent the maximum obtainable.

No estimates are given for miscellaneous land types and for the soils that are not commonly used for the specified crops. Such soils include those mapped in complexes or associations, overflow phases of Falaya silt loam and of Mantachie soils, and Ruston soils.

Following are general management practices assumed for yields in "B" columns of table 2.

1. Fertilizer applied according to the needs indicated by chemical tests and by past cropping and fertilizer practices.
2. Use of high-yielding varieties that are suited to the area.
3. Adequate seedbed preparation.
4. Planting or seeding by suitable methods, at suitable rates, and at the right time.
5. Inoculation of legume seed.
6. Shallow cultivation of row crops.
7. Control of weeds, insects, and diseases.
8. Use of soil-conserving cropping systems, such as are suggested in the section on capability units.
9. Water management where needed, sodding of waterways, contour cultivation, terracing, and stripcropping.
10. Good management of crop residues.

Following are specific management practices, by crops, under which yields shown in table 2 were obtained.

Cotton.—For cotton, practices at the two levels of management are—

Level A: 30 to 60 pounds of nitrogen and 30 to 40 pounds each of phosphate and potash per acre.
Level B: 66 to 90 pounds of nitrogen and 48 to 60 pounds each of phosphate and potash per acre.

TABLE 2.—*Estimated average acre yields of the principal crops under two levels of management*

[Yields in "A" columns are those obtained under common management practices; those in "B" columns are yields to be expected under improved management. Absence of figure indicates crop is not commonly grown]

Soil	Cotton		Corn		Soybeans		Oats	
	A	B	A	B	A	B	A	B
	Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Almo silt loam	-----	-----	40	50	17	27	-----	-----
Atwood silt loam, 2 to 5 percent slopes, eroded	475	750	60	90	17	32	40	80
Atwood silt loam, 2 to 5 percent slopes, severely eroded	450	700	55	85	15	28	40	80
Atwood silt loam, 5 to 8 percent slopes, severely eroded	425	675	50	80	15	25	35	75
Atwood silt loam, 8 to 12 percent slopes, severely eroded	400	650	45	75	15	25	30	70
Bude silt loam, 0 to 2 percent slopes	425	575	30	50	15	25	30	60
Bude silt loam, 2 to 5 percent slopes	450	600	30	60	15	25	30	60
Bude silt loam, 2 to 5 percent slopes, eroded	425	550	30	55	15	25	30	60
Chastain soils	300	500	35	50	18	27	28	60
Collins silt loam	500	850	65	90	15	25	40	80
Collins silt loam, local alluvium	500	850	65	90	15	25	40	80
Dulac silt loam, 2 to 5 percent slopes, eroded	450	700	45	75	18	25	40	80
Dulac silt loam, 2 to 5 percent slopes, severely eroded	425	650	40	70	15	25	35	70
Dulac silt loam, 5 to 8 percent slopes, severely eroded	400	625	35	60	15	25	33	65
Falaya silt loam	450	750	65	85	18	25	35	75
Falaya silt loam, local alluvium	450	750	65	85	18	25	35	75
Falkner silt loam, 0 to 2 percent slopes	425	575	30	50	15	25	30	60
Falkner silt loam, 2 to 5 percent slopes, eroded	450	600	30	60	15	25	30	60
Falkner silt loam, 2 to 5 percent slopes, severely eroded	425	550	30	55	15	25	30	60
Falkner silt loam, 5 to 8 percent slopes, eroded	400	525	25	50	12	25	25	55
Falkner silt loam, 5 to 8 percent slopes, severely eroded	350	500	23	45	12	20	20	50
Freeland silt loam, 2 to 5 percent slopes, eroded	450	700	45	75	18	25	40	80
Hatchie silt loam, 0 to 2 percent slopes	450	600	35	65	18	25	50	70
Hatchie silt loam, 2 to 5 percent slopes	450	600	35	65	18	25	50	70
Iuka soils	500	850	65	80	15	25	40	80
Iuka soils, local alluvium	500	850	65	80	15	25	40	80
Mantachie soils	500	850	65	80	15	25	45	60
Mantachie soils, local alluvium	500	850	65	80	15	25	45	60
Ora loam, 2 to 5 percent slopes, severely eroded	425	650	40	65	15	25	35	70
Ora loam, 5 to 8 percent slopes, severely eroded	400	625	35	60	12	22	33	65
Ora loam, 8 to 12 percent slopes, severely eroded	375	600	30	55	10	18	30	60
Ora silt loam, 2 to 5 percent slopes, eroded	425	700	45	65	18	30	40	80
Ora silt loam, 5 to 8 percent slopes, eroded	425	650	40	65	15	25	35	70
Providence silt loam, 2 to 5 percent slopes, eroded	450	700	45	75	18	25	40	80
Providence silt loam, 2 to 5 percent slopes, severely eroded	425	650	40	70	15	25	35	70
Providence silt loam, 5 to 8 percent slopes, eroded	425	650	40	70	15	25	35	70
Providence silt loam, 5 to 8 percent slopes, severely eroded	375	625	35	65	12	22	33	65
Providence silt loam, 8 to 12 percent slopes, severely eroded	350	600	30	60	10	18	30	60
Tickfaw silt loam	-----	-----	40	50	17	27	-----	-----
Urbo silty clay loam	450	750	50	80	18	25	35	75
Waverly and Bibb soils	300	400	25	50	17	25	28	40

Corn.—For corn, practices at the two levels of management are—

Level A: 45 to 65 pounds of nitrogen and 20 to 35 pounds each of phosphate and potash per acre; 8,000 to 10,000 plants per acre.

Level B: 90 to 120 pounds of nitrogen and 40 to 60 pounds each of phosphate and potash per acre; 10,000 to 12,000 plants per acre.

Oats.—For oats, practices at the two levels of management are—

Level A: 45 to 60 pounds of nitrogen and 20 to 35 pounds each of phosphate and potash per acre.

Level B: 90 to 120 pounds of nitrogen and 45 to 60 pounds each of phosphate and potash per acre.

Soybeans.—For soybeans, practices at the two levels of management are—

Level A: 40 to 50 pounds of phosphate and 20 to 25 pounds of potash at planting time; inoculation of seed.

Level B: 60 pounds of phosphate and 30 pounds of potash at planting time; inoculation of seed.

Estimated yields for the principal forage crops at high and low levels of liming and fertilization are given in table 3. The figures are based on yields obtained in long-term experiments and on estimates by agronomists and other agricultural workers who have had experience with forage crops and soils in Tippah County.

All estimates are for yields from soils that have not been irrigated; they are based on average rainfall.

The soils are placed in six groups. Each group consists of soils that are similar in productivity for given plant mixtures and in requirements for conservation practices and other management.

The annual fertilization is the amount of fertilizer necessary for each group of plants if the yields given in the last two columns are to be obtained; it is not a recommendation. The pH values indicate the reaction necessary for the high and the low level of fertilization.

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TABLE 3. *Estimated average acre yields of pasture and hay, by groups of soils, at high and low levels of liming and fertilization*

[N stands for elemental nitrogen; P for phosphate; K for potash. Absence of figures indicates soils are not commonly used for crop]

Soils	Plants for pasture or hay	Annual fertilization	pH brought to—	Yields: Pasture	Yields: Hay
		Pounds per acre		*Animal unit months*	*Tons*
Group 1: Atwood silt loam, 2 to 5 percent slopes, eroded. Dulac silt loam, 2 to 5 percent slopes, eroded. Freeland silt loam, 2 to 5 percent slopes, eroded. Ora silt loam, 2 to 5 percent slopes, eroded. Ora silt loam, 5 to 8 percent slopes, eroded. Providence silt loam, 2 to 5 percent slopes, eroded. Providence silt loam, 5 to 8 percent slopes, eroded.	Bahiagrass or common bermudagrass mixed with crimson clover, annual lespedeza, white clover, vetch, or wild winter peas.	High: N,100; P,60; K,60	6.0	9.6	2.9
		Low: N,20; P,10; K,10	5.4	5.7	1.6
	Coastal bermudagrass mixed with crimson clover, annual lespedeza, white clover, vetch, or wild winter peas.	High: N,100; P,60; K,60	6.0	12.1	4.0
		Low: N,20; P,10; K,10	5.2	8.0	1.6
	Oats, wheat, and ryegrass	High: N,150; P,90; K,60	6.0	7.1	2.2
		Low: N,30; P,30; K,10	5.4	4.0	1.1
	Millet or sudangrass	High: N,120; P,60; K,50	6.0	7.0	3.0
		Low: N,30; P,30; K,10	5.4	3.0	1.1
Group 2: Atwood silt loam, 2 to 5 percent slopes, severely eroded. Atwood silt loam, 5 to 8 percent slopes, severely eroded. Atwood silt loam, 8 to 12 percent slopes, severely eroded. Dulac silt loam, 2 to 5 percent slopes, severely eroded. Dulac silt loam, 5 to 8 percent slopes, severely eroded. Falkner silt loam, 2 to 5 percent slopes, severely eroded. Falkner silt loam, 5 to 8 percent slopes, severely eroded. Ora loam, 2 to 5 percent slopes, severely eroded. Ora loam, 5 to 8 percent slopes, severely eroded. Ora loam, 8 to 12 percent slopes, severely eroded. Providence silt loam, 2 to 5 percent slopes, severely eroded. Providence silt loam, 5 to 8 percent slopes, severely eroded. Providence silt loam, 8 to 12 percent slopes, severely eroded.	Bahiagrass or common bermudagrass with crimson clover, lespedeza, or vetch.	High: N, 100; P, 60; K, 60	6.0	8.0	2.4
		Low: N, 20; P, 10; K, 10	5.4	4.7	1.1
	Sericea lespedeza	High: N, 0; P, 90; K, 60	6.0	5.6	2.2
		Low: N, 0; P, 30; K, 10	5.4	3.3	1.1
	Oats, wheat, and ryegrass	High: N, 150; P, 90; K, 60	6.0	6.4	2.0
		Low: N, 30; P, 30; K, 10	5.4	3.2	1.0
	Millet or sudangrass	High: N, 120; P, 60; K, 50	6.0	6.7	2.8
		Low: N, 30; P, 30; K, 10	5.4	2.4	.9
Group 3: Almo silt loam. Bude silt loam, 0 to 2 percent slopes. Bude silt loam, 2 to 5 percent slopes. Bude silt loam, 2 to 5 percent slopes, eroded. Falkner silt loam, 0 to 2 percent slopes. Falkner silt loam, 2 to 5 percent slopes, eroded. Falkner silt loam, 5 to 8 percent slopes, eroded. Tickfaw silt loam.	Vetch, wild winter peas, or white clover.	High: N, 100; P, 60; K, 60	6.0	8.3	2.9
		Low: N, 20; P, 20; K, 10	5.4	5.1	1.6
	Tall fescue with vetch, wild winter peas, or white clover.	High: N, 100; P, 60; K, 60	6.0	6.7	2.0
		Low: N, 20; P, 20; K, 10	5.4	3.4	1.2
	Common bermudagrass or bahiagrass with vetch, wild winter peas, or white clover.	High: N, 100; P, 60; K, 60	6.0	8.0	2.4
		Low: N, 20; P, 20; K, 10	5.4	4.6	1.3
	Oats, wheat, and ryegrass	High: N, 150; P, 90; K, 60	6.0	6.6	2.0
		Low: N, 30; P, 30; K, 10	5.4	3.3	1.0
Group 4: Ruston soils, 12 to 17 percent slopes. Ruston soils, 12 to 17 percent slopes, eroded.	Bahiagrass or common bermudagrass with crimson clover, lespedeza, or vetch.	High: N, 100; P, 60; K, 60	6.0	5.6	1.7
		Low: N, 20; P, 10; K, 10	5.4	3.3	.8
	Sericea lespedeza	High: N, 0; P, 90; K, 60	6.0	3.9	1.5
		Low: N, 0; P, 30; K, 10	5.4	2.3	.8

TABLE 3.—*Estimated average acre yields of pasture and hay, by groups of soils, at high and low levels of liming and fertilization*—Continued

Soils	Plants for pasture or hay	Annual fertilization	pH brought to—	Yields	
				Pasture	Hay
		Pounds per acre		*Animal-unit months*	*Tons*
Group 5:					
Collins silt loam.	Common bermudagrass or bahiagrass with white clover, wild winter peas, or vetch.	High: N, 100; P, 60; K, 60	6.0	11.0	3.2
Collins silt loam, local alluvium.		Low: N, 20; P, 10; K, 10	5.3	7.3	2.1
Falaya silt loam.					
Falaya silt loam, local alluvium.	Dallisgrass with white clover, wild winter peas, or vetch.	High: N, 100; P, 60; K, 60	6.5	11.3	3.3
Iuka soils.		Low: N, 20; P, 10; K, 10	5.5	7.5	2.2
Iuka soils, local alluvium.	Oats, wheat, and ryegrass	High: N, 150; P, 90; K, 60	6.5	7.0	3.0
Urbo silty clay loam.		Low: N, 30; P, 30; K, 10	5.7	3.2	1.0
	Tall fescue with white clover, wild winter peas, or vetch.	High: N, 150; P, 90; K, 60	6.5	9.6	2.9
		Low: N, 30; P, 30; K, 10	5.7	4.9	1.5
Group 6:					
Chastain soils.	Dallisgrass with white clover or wild winter peas.	High: N, 150; P, 60; K, 60	6.0	10.0	3.0
Falaya silt loam, overflow.		Low: N, 20; P, 10; K, 10	5.5	7.5	2.2
Mantachie soils, overflow.	Fescue with white clover or wild winter peas.	High: N, 150; P, 60; K, 60	6.1	9.3	2.8
Waverly and Bibb soils.		Low: N, 30; P, 30; K, 10	5.5	6.3	1.8

Pasture yields are given in animal-unit-months. An animal-unit-month is the equivalent in months that one acre will graze one animal unit without injury to the pasture. An animal unit is one 1,200-pound cow; two 500 pound yearlings; five ewes with lambs; five sows with litters to weaning age; twenty 50- to 150-pound pigs; one horse; or one mule.

Yields are given in tons of air-dried hay.

These data are useful in developing balanced grazing plans and in calculating safe stocking rates for pastures.

No estimates are given if the soil is difficult to manage, or if it is not commonly used for, or not suitable for, grazing.

Woodland

When the early settlers arrived, Tippah County was an area of pine and hardwood forests traversed by clear, deep streams. Wildlife was abundant in the forests and streams, and it was an important source of food and of trade goods before land was cleared so crops could be grown. The forests also influenced the selection of sites for farmsteads. Certain kinds of trees were known to grow only on fertile soils; hence, areas where these kinds of trees grew were the first to be claimed.

It is estimated that 70 percent of Tippah County has been cleared and cropped. When the soils are depleted of their natural fertility by cropping and by erosion, they are used as pasture or are abandoned.

Forest Types

Hardwoods were dominant in the forests when the first settlers arrived. Except on the Coastal Plains in the east central and southeastern parts of the county, there was little pine. Most of the upland soils, which once supported good stands of hardwoods, have been depleted through misuse and can now be used more profitably to grow pine.

In 1957, commercial forest covered 54.7 percent of Tippah County (*12*).[2]

Two major forest types are represented: the oak-pine type and the loblolly pine shortleaf pine type. The oak-pine type is the more extensive. It is forest in which 50 percent or more of the stand is hardwoods (*11*), generally upland oaks. Only 15 to 20 percent of the area is suited to the production of upland oaks. Approximately 70 percent of the area lacks an adequate source of pine seed, and new stands must be established by seeding or setting out seedlings.

The loblolly pine shortleaf pine type is forest in which 50 percent or more of the stand is loblolly pine or shortleaf pine. It is estimated that 75 percent of the acreage is already adequately stocked with pine or has an adequate source of pine seed.

Woodland Groups

Production of wood crops, like other farming enterprises, requires careful management and planning, for which a knowledge of soils is essential (*19*). Species suitability differs among similar soils, according to the degree of erosion. Moreover, different areas of the same kind of soil, because of topographic position and past erosion, are likely to react differently to the same management practices. A knowledge of these different reactions can help managers plan specific low-cost practices or adjust present practices where needed. Such adjustments increase the probability of a successful wood crop and also decrease the cost of production.

Management of woodland can be planned more easily if soils are grouped according to texture, drainage, topography, and other characteristics that affect potential productivity, species suitability, and management requirements. All of the soils of Tippah County have been evaluated on the basis of such characteristics, and 13 woodland groups have been set up.

[2] Italic numbers in parentheses refer to Literature Cited, p. 95

Descriptions of these 13 groups and discussions of the potentialities and limitations of the soils in each group are given in the following pages. Table 4 provides a summary of the information in the text. The column headings in table 4 are explained in the following paragraphs.

Stand capability type: Of extreme importance to an owner of woodland is the stand capability type, which refers to the type of forest, rather than to the individual kinds of forest trees, that will grow best on a given site. Forests have to be managed by stands rather than by individual trees. Pure stands are easier to manage than mixed stands and are more productive.[3] The first step in placing an area under woodland management is to classify the soils according to their stand capability type. In Tippah County the type may be pine, hardwood, or pine-hardwood. If at least 80 percent of the acreage consists of soils best suited to hardwoods, the stand capability type is hardwood. If the soils are suited to both species and neither species makes up 80 percent of the stand, or if the individual sites for each species are so small or so mixed that it is more practical to manage for the production of both species, the stand capability type is pine-hardwood.

To be favored in management: In this column are listed the commercially valuable species most common in established woodland. Also to be favored, though not listed, are scattered individual trees of high value.

To be favored for planting: In this column are listed the species to be preferred for planting. Past use of the soil must be considered in selecting species for planting. For example, no hardwoods except cottonwood should be planted in fields that have been row cropped within the past 2 years. All hardwoods except cottonwood can be planted successfully in openings in established woodlands.

Plant competition: Plant competition refers to the degree to which undesirable brush, trees, and plants are likely to invade a stand and hinder the establishment and growth of desirable trees. It is directly affected by (1) the natural fertility and topographic position of the soil; (2) the degree of erosion; (3) the length of time since erosion has occurred; (4) the length of time the soil has been protected from fire and harmful grazing; and (5) past management.

Competition is *slight* if unwanted plants are no special problem. It is *moderate* if the invaders delay but do not prevent the establishment of a normal, fully stocked stand. It is *severe* if desirable trees do not regenerate naturally. Where competition is severe, some site preparation is generally required to insure regeneration.

Seedling mortality: Even when healthy seedlings of suitable species are correctly planted or occur naturally in adequate numbers, some of them will not survive if characteristics of the soil are unfavorable. Plant competition is not considered in this rating. Water hazards are considered in some of the bottom-land soils.

Mortality is *slight* if not more than 25 percent of the planted seedlings die, or if trees ordinarily regenerate naturally in places where there are enough seeds. It is *moderate* if 25 to 50 percent of the seedlings die, or if trees do not regenerate naturally in numbers needed for adequate restocking. It is *severe* if more than 50 percent of the planted seedlings die, or if trees do not ordinarily reseed naturally in places where there are enough seeds.

Erosion hazard: Erosion hazard is rated according to the risk of erosion in well-managed woodland that is not protected by special practices.

The hazard is *slight* if there is no special problem. It is *moderate* if there would be a moderate loss of soil if runoff is not controlled and the vegetative cover is not adequate for protection. Where the hazard is moderate, care should be taken in locating haul roads and skid trails. The hazard is *severe* if steep slopes, rapid runoff, slow infiltration, slow permeability, and past erosion make the soil susceptible to severe erosion. Where the hazard is severe, care is needed in locating haul roads, skid trails, loading areas, and stream crossings, and in selecting skidding methods.

Windthrow hazard: Windthrow hazard, or wind firmness, is rated according to the ability of the soil to support trees during periods of high winds.

The hazard is *slight* if there is no special problem. It is *moderate* if the trees are stable except during short periods of excessive wetness. It is *severe* if the soil and tree roots do not give enough stability to keep trees from blowing over if they are not protected by other trees.

Equipment limitation: Soil or topographic features may restrict or prohibit the use of ordinary equipment in the management of woodland.

The limitation is *slight* if there is no special problem. It is *moderate* if slopes are steep and if the seasonal restriction on heavy equipment lasts less than 3 months. The limitation is *severe* if the seasonal restriction on equipment lasts more than 3 months or if special logging equipment is needed.

Site index: The potential productivity of a soil for a specified kind of tree is expressed as a *site index*. A site index is the height, in feet, that a specified kind of tree growing on a specified soil will reach at a specified age. It depends mainly on the capacity of the soil to provide moisture and growing space for tree roots. The site index for loblolly pine, shortleaf pine, sweetgum, and cherrybark oak is based on height at 50 years of age. The site index for cottonwood is based on height at 30 years of age.

The ranges in site index given in table 4, though based on limited data and subject to change, are applicable to at least 90 percent of the area occupied by the soils of the specified groups. Variations above and below these ranges are possible, because of differences in topographic position, depth to water table, or other factors, but such variations are unusual.

[3] A stand may contain as much as 20 percent of another type and still be considered a pure stand.

Woodland group 1

This group consists of well-drained upland soils that have a deep root zone. The slope range is 12 to 45 percent. The surface layer is brown sandy loam or loamy sand. The subsoil is red, friable sandy clay loam to a depth of about 44 inches. Below this depth is red, very friable sandy loam. The available water capacity is moderate. These soils are strongly acid. They are—

Ruston soils, 12 to 17 percent slopes.
Ruston soils, 12 to 17 percent slopes, eroded.
Ruston soils, 17 to 45 percent slopes.

The stand capability type is pine. Both shortleaf pine and loblolly pine are well suited, but shortleaf pine is predominant in naturally occurring stands.

Individual hardwoods of good quality grow along drainways, around drainheads, and in coves in steep and very steep areas. White oak, southern red oak, Shumard oak, sweetgum, and yellow-poplar are the species to be favored. Several species of hickories also grow on these soils. Good individual hickory trees should be managed for maximum yield of commercial products and for benefit to wildlife.

The site index for loblolly pine is 75 to 85, and that for shortleaf pine is 65 to 75. Generally the site index for a given species is 5 to 7 more on lower slopes than on upper slopes.

Plant competition is slight to moderate. Proper cutting and logging practices generally provide sufficient site preparation for regeneration of pine. If reproduction of pine is not established in 3 or 4 years, additional site preparation will likely be needed. If planting is necessary in order to establish a stand it should be done during the first planting season after harvest.

Seedling mortality is slight in years when summer rainfall is normal.

The erosion hazard is slight to moderate if proper logging techniques are used. In steep areas, there should be minimum soil disturbance. Where possible, logs should be skidded uphill.

The equipment limitation is moderate on the steeper slopes. Special equipment for skidding may be needed, and an adequate number of loading points is essential.

The windthrow hazard is slight except for single, isolated, large-crowned trees that are left in openings or within a group of smaller trees.

Woodland group 2

This group consists of well drained and moderately well drained upland and terrace soils that have a deep to shallow root zone. The slope range is 2 to 12 percent. The surface layer is silt loam, and the subsoil is silty clay loam or silt loam. The available water capacity is moderate to high. These soils are—

Atwood silt loam, 2 to 5 percent slopes, eroded.
Atwood silt loam, 2 to 5 percent slopes, severely eroded.
Atwood silt loam, 5 to 8 percent slopes, severely eroded.
Atwood silt loam, 8 to 12 percent slopes, severely eroded.
Dulac silt loam, 2 to 5 percent slopes, eroded.
Dulac silt loam, 2 to 5 percent slopes, severely eroded.
Dulac silt loam, 5 to 8 percent slopes, severely eroded.
Freeland silt loam, 2 to 5 percent slopes, eroded.
Providence silt loam, 2 to 5 percent slopes, eroded.
Providence silt loam, 2 to 5 percent slopes, severely eroded.
Providence silt loam, 5 to 8 percent slopes, eroded.
Providence silt loam, 5 to 8 percent slopes, severely eroded.
Providence silt loam, 8 to 12 percent slopes, severely eroded.

The stand capability type is pine (fig. 9). Both loblolly pine and shortleaf pine are suited, but loblolly pine is preferable for planting. Established stands of hardwoods along drains, around drainheads, and on terraces should be managed. Most of the acreage has been cleared and used for either crops or pasture.

Plant competition is slight to moderate, depending on the past use of the soils and on the length of time they have been protected from wildfire. In areas that were once cultivated or pastured, plant competition is slight. In established woodlands that have been protected for 15 years or more from overgrazing and wildfire, competition is moderate, and if pines are not reestablished in these areas by the third year after proper cutting, additional site treatment is needed. Intensive forest management increases the likelihood of encroachment by brush. Forest managers should consider regular and periodic treatment for control of plant competition.

Seedling mortality is slight in years when summer rainfall is normal. If the moisture supply is not normal, losses are likely to be concentrated in areas where past use has been such that conditions are not favorable for the establishment of seedlings.

The erosion hazard, the windthrow hazard, and the equipment limitation are slight and cause no problems if proper cutting and logging techniques are used.

Potential productivity is good. The site index for loblolly pine is 76 ± 5, and that for shortleaf pine is $67-5$.

Woodland group 3

This group consists of somewhat poorly drained soils on uplands and terraces. These soils have a fragipan or clay layer and a shallow root zone. The surface layer is silt loam, and the subsoil is silty clay loam or silt loam. The available water capacity is moderate to low. Except in severely eroded areas, the depth to the pan is 19 to 24 inches. The soils in this group are—

Bude silt loam, 0 to 2 percent slopes.
Bude silt loam, 2 to 5 percent slopes.
Bude silt loam, 2 to 5 percent slopes, eroded.
Falkner silt loam, 0 to 2 percent slopes.
Falkner silt loam, 2 to 5 percent slopes, eroded.
Falkner silt loam, 2 to 5 percent slopes, severely eroded.
Falkner silt loam, 5 to 8 percent slopes, eroded.
Falkner silt loam, 5 to 8 percent slopes, severely eroded.
Hatchie silt loam, 0 to 2 percent slopes.
Hatchie silt loam, 2 to 5 percent slopes.

The stand capability type is pine-hardwood. Pine will grow in all areas of these soils except those where past use has resulted in unfavorable conditions. Pine is better suited than hardwoods to slightly and moderately eroded areas on ridges, in pastures, and in abandoned fields. Both loblolly pine and shortleaf pine are suitable, but loblolly is to be preferred, particularly for conversion planting, because it grows faster than shortleaf and therefore withstands competition better.

Both pine and hardwoods grow on terraces, along drains, and around drainheads. Cherrybark oak, cow oak, Shumard oak, water oak, and sweetgum should be favored on these minor sites. Hickories of several species also grow in these places.

TABLE 4.—*Woodland groups, potential productivity, and ratings*

Woodland groups and map symbols	Description	Species suitability	
		Stand capability type	To be favored in management—
Group 1 (RnE, RnE2, RnF)	Well-drained, slightly eroded upland soils	Pine	Loblolly pine and shortleaf pine. Along drains and drainheads, also favor white oak, Shumard oak, sweetgum, and yellow-poplar.
Group 2 (AtB2, AtB3, AtC3, AtD3, DuB2, DuB3, DuC3, FrB2, PdB2, PdB3, PdC2, PdC3, PdD3)	Well drained and moderately well drained, slightly eroded to severely eroded upland and terrace soils.	Pine	Loblolly pine and shortleaf pine. Along drains and drainheads, favor established groups of hardwoods.
Group 3 (BuA, BuB, BuB2, FkA, FkB2, FkB3, FkC2, FkC3, HaA, HaB)	Somewhat poorly drained, slightly eroded to severely eroded upland and terrace soils.	Pine-hardwood.	Loblolly pine and shortleaf pine. On terraces and along drains and drainheads, also favor cherrybark oak, sweetgum, cow oak, white oak, Shumard oak, and water oak.
Group 4 (OrB3, OrC3, OrD3, OsB2, OsC2)	Well drained and moderately well drained, moderately eroded to severely eroded, sandy upland soils; fragipan.	Pine	Loblolly pine and shortleaf pine
Group 5 (Ao, Tc)	Poorly drained upland and terrace soils	Pine	Loblolly pine and shortleaf pine
Group 6 (Cn, Co, Fa, Fc, Ff)	Moderately well drained and somewhat poorly drained soils in alluvium derived from loess; bottom land.	Hardwood	Water oak, cottonwood, cherrybark oak, persimmon, Shumard oak, white oak, and yellow-poplar.
Group 7 (Ik, Iu, Ma, Mc, Mf)	Moderately well drained and somewhat poorly drained, coarse-textured soils derived from Coastal Plain sediments; bottom land.	Hardwood	Cottonwood, cherrybark oak, white oak, water oak, willow oak, and yellow-poplar.
Group 8 (Ch, Ur, Wb)	Poorly drained soils derived from loess, coarse-textured soils derived from Coastal Plain sediments, and fine-textured, somewhat poorly drained and poorly drained soils; bottom lands.	Hardwood	Ash, baldcypress, cherrybark oak, swamp chestnut, willow oak, water oak, sweetgum, and overcup oak.
Group 9 (DwD, DwD3)	Strongly sloping, moderately well drained and somewhat poorly drained, fine-textured upland soils; fragipan; severe erosion hazard.	Pine	Loblolly pine and shortleaf pine
Group 10 (WcE, WcE3, WcF, WcF3)	Steep and moderately steep, somewhat poorly drained and moderately well drained, fine textured upland soils; severe erosion hazard.	Pine	Loblolly pine and shortleaf pine
Group 11 (RsE, RsE2, RsF, RuE2, RuF)	Steep and moderately steep, well drained and moderately well drained, fine-textured and coarse-textured soils; severe erosion hazard.	Pine	Loblolly pine and shortleaf pine
Group 12 (Gc, Gn)	Well drained to somewhat poorly drained, gullied upland areas; 5 to 45 percent slopes.	Pine	Loblolly pine and shortleaf pine
Group 13 (Mn, Mo)	Moderately well drained or somewhat poorly drained, stratified sandy and silty alluvium.	Hardwood	Cottonwood, cherrybark oak, white oak, water oak, willow oak, and yellow-poplar.

[1] Site-index ratings are from limited data and are subject to change. (Refer to descriptions of woodland groups.)

[2] In old fields that can be cultivated the first year.

[3] In old fields if cottonwood is not desired. Stand will convert to hardwood when pine is harvested.

for major limitations and hazards affecting management

Species suitability	Limitations and hazards					Site index [1]
To be favored for planting—	Plant competition	Seedling mortality	Erosion hazard	Windthrow hazard	Equipment limitation	
Loblolly pine	Slight to moderate.	Slight	Slight to moderate.	Slight	Moderate	Loblolly pine: Ridges and upper slopes, 74 to 79. Middle slopes, 76 to 83. Lower slopes, 78 to 88. Shortleaf pine: Ridges and upper slopes, 59 to 63. Middle slopes, 63 to 68. Lower slopes, 67 to 77.
Loblolly pine	Slight	Slight	Slight	Slight	Slight	Loblolly pine, 76±5. Shortleaf pine, 67±5.
Loblolly pine	Moderate	Slight	Slight	Slight	Slight	Loblolly pine, 78±5. Shortleaf pine, 68±5.
Loblolly pine	Slight	Slight	Moderate	Slight	Slight	Loblolly pine, 82±5. Shortleaf pine, 71±5.
Loblolly pine	Moderate	Slight	Slight	Moderate	Moderate	Loblolly pine, 81±5.
Cottonwood,[2] loblolly pine,[3] cherrybark oak, and yellow-poplar.[4]	Moderate	Slight	Slight	Moderate	Moderate	Cherrybark oak, 102±7. Cottonwood, 107±7. Sweetgum, 103±5.
Cottonwood,[2] loblolly pine,[3] cherrybark oak, and yellow-poplar.[4]	Moderate	Slight	Slight	Moderate	Moderate	Cherrybark oak, 99±5. Sweetgum, 100±5.
Ash, cherrybark oak, sweetgum, swamp chestnut oak, and loblolly pine.[3]	Moderate	Moderate	Slight	Moderate to severe.	Moderate to severe.	Cherrybark oak, 94±5. Sweetgum, 90±5.
Loblolly pine	Moderate	Slight	Moderate	Slight to moderate.	Moderate	Loblolly pine, 75 to 85. Shortleaf pine, 55 to 75.
Loblolly pine	Slight to moderate.	Slight to moderate.	Severe	Slight	Moderate	Loblolly pine, 75 to 85. Shortleaf pine, 60 to 72.
Loblolly pine	Moderate	Slight	Moderate to severe.	Slight	Moderate	Loblolly pine, 75 to 85. Shortleaf pine, 55 to 75.
Loblolly pine	Variable	Variable	Variable	Variable	Variable	Variable.
Cherrybark oak and sweetgum.	Moderate	Slight	Slight	Moderate	Moderate	Cherrybark oak, 99±5. Sweetgum, 100±5.

[4] Interplant in openings made by proper harvesting within established woodlands.

Figure 9.—A 22-year-old stand of pine on Dulac silt loam, 5 to 8 percent slopes, severely eroded.

Management of the pine-hardwood mixture is less expensive than management of a pure stand of pine, and it presents fewer problems. It benefits wildlife and provides a variety of marketable products.

Potential productivity is good. The site index for loblolly pine is 78±5, and that for shortleaf pine is 68±5. No site indexes are available for the hardwood species.

Plant competition is moderate. Ordinarily, no site treatment other than proper cutting and logging is needed for regeneration of pine. Additional treatment is needed only if an adequate new stand is not established by the third year after cutting. On terraces, along drains, and around drainheads, competition may delay but generally does not prevent the regeneration of hardwoods. Site treatment is needed for regeneration of pine on these sites unless the new stand is established by the second year after cutting. If establishment of pure pine stands is attempted, periodic treatment for control of competition should be considered.

Seedling mortality is slight. An excellent rate of survival can be expected in years of normal rainfall.

The erosion hazard is slight. On slopes of 5 percent or more, access roads and logging roads should be located on the contour where possible, and haul roads should not be adjacent to drains and streams.

The windthrow hazard is slight to moderate. The fragipan restricts the growth of roots. It also impedes the downward movement of water and causes a perched water table in wet weather. Isolated large-crowned trees, especially if near drains, are subject to windthrow in wet weather.

The equipment limitation is slight. Limiting operations to the drier seasons reduces the cost of logging and equipment upkeep.

Woodland group 4

This group consists of moderately well drained and well drained upland soils that have a fragipan and a moderately deep root zone. The slope range is 2 to 12 percent. The surface layer is silt loam to loam, and the subsoil is heavy loam. The available water capacity is moderate. In wooded areas the depth to the fragipan is about 28 inches. These soils are—

Ora loam, 2 to 5 percent slopes, severely eroded.
Ora loam, 5 to 8 percent slopes, severely eroded.
Ora loam, 8 to 12 percent slopes, severely eroded.
Ora silt loam, 2 to 5 percent slopes, eroded.
Ora silt loam, 5 to 8 percent slopes, eroded.

The stand capability type is pine. Both loblolly pine and shortleaf pine are well suited, but loblolly pine is preferable for planting. Good individual hardwoods along drains and on the lower slopes should be managed for production of wood crops and for benefit to wildlife.

Potential productivity is very good. The site index for loblolly pine is 82±5, and that for shortleaf pine is 71±5.

Plant competition is slight. Nearly all of the acreage was once cleared and used for crops or pasture. Proper cutting and logging practices are generally sufficient site preparation. If a new stand is not established by the third year after cutting, additional site treatment is needed.

Seedling mortality is slight. The past use of the soils affects the rate of mortality. Losses are likely to be concentrated in eroded areas and in areas that were once heavily grazed. At the end of the second growing season, a survival check should be made, and areas where losses are severe should be reforested.

The erosion hazard is moderate. Permanent roads should be so located as to reduce the erosion hazard. If roads are next to drains or streams, floods may cause erosion in wheel tracks and skid trails. Where possible, roads should cross streams at right angles.

The windthrow hazard is slight, except in extremely high winds.

The equipment limitation is slight. Logging when the soils are excessively wet should be avoided, but otherwise, careful management will permit year-round logging.

Woodland group 5

This group consists of poorly drained upland and terrace soils that have a very shallow root zone. The slope is 0 to 2 percent. The surface layer is silt loam, and the subsoil is silty clay loam or silt loam. The available water capacity is low to moderate. These soils are—

Almo silt loam.
Tickfaw silt loam.

The stand capability type is pine. Both loblolly pine and shortleaf pine are well suited, but loblolly is the species to favor in planting. Mixed stands of pine and sweetgum grow on terraces. Sweetgum is common where past management has eliminated the source of pine seed. Sweetgum can be managed in short rotations for small-bolt material, but it cannot be managed in long rotations for sawtimber because it is subject to dieback. Pine can be managed for sawtimber.

Potential productivity is good. The site index for loblolly pine is 81±5. No site index has been established for sweetgum, because the available data are insufficient.

Plant competition is moderate for pine. Natural regeneration generally takes place with no site preparation except proper cutting and logging. If a new stand is not established by the third year after cutting, additional site treatment is needed. Periodic treatment for the control of competing vegetation should be considered if the terrace sites are managed intensively for the production of pine.

Seedling mortality is slight. A survival check and decision as to whether replanting is necessary can be made in the first year.

The erosion hazard is slight and presents no problem if normal logging methods are used.

The windthrow hazard is moderate. The soils are stable except during short periods when they are excessively wet. Single large-crowned trees should not be left exposed.

The equipment limitation is moderate. Restrictions caused by wetness generally last less than 3 months. Since the topography is nearly level, logging in dry weather can be accomplished quickly and efficiently, requires a minimum amount of equipment, and causes little damage to the soils.

Woodland group 6

This group consists of moderately well drained and somewhat poorly drained alluvial soils that consist of material washed from loessal uplands. The slope is 0 to 2 percent. The texture is silt loam throughout the profile. The available water capacity is moderate to high. These soils are—

Collins silt loam.
Collins silt loam, local alluvium.
Falaya silt loam.
Falaya silt loam, local alluvium.
Falaya silt loam, overflow.

The stand capability type is hardwoods. All good bottom-land hardwoods grow on these soils. Species suitability and site index differ slightly from one area to another, because drainage and the natural supply of moisture differ.

Cottonwood, cherrybark oak, persimmon, Shumard oak, white oak, yellow-poplar, and water oak are the species most common in the stands, and the ones to be favored in management. Selection of species for planting depends on past use of the soils. Cottonwood is to be preferred for planting in fields that have recently been used for cultivated crops. Unless the plantings are to be cultivated the first year, however, loblolly pine is preferable to cottonwood. Pine will last through only one rotation. After the first intermediate cutting, the site will convert to hardwoods. Cherrybark oak, yellow-poplar, or sweetgum can generally be planted successfully in large openings made in established woodlands by harvest cutting.

Potential productivity is excellent. The site indexes differ because of differences in the natural supply of moisture, but ratings of 107±7 for cottonwood, 103±5 for sweetgum, and 102±7 for cherrybark oak are generally applicable. Specific information on methods of classifying variations in soils and moisture supply is given in "Literature Cited" (*3*, *4*, *5*).

Plant competition is moderate. Though competition develops, it does not generally prevent establishment of desirable species if sufficient openings are created in the marking and logging operations. The severe competition that develops after wildfire and in small openings is likely to prevent regeneration of desirable hardwoods for a number of years. Good management and intensive fire-control practices can prevent the need for costly site preparation.

Seedling mortality and the erosion hazard are slight and generally present no problems.

The windthrow hazard is moderate. There is little windthrow damage except during short periods of ex-

cessive wetness and high-velocity winds. Single large-crowned trees should not be left in openings or within a group of smaller trees.

The equipment limitation is moderate. Wetness is the only cause of restrictions, and only in unusually wet years do these restrictions last more than 3 months. Essential to management are suitably located and well-maintained access roads that also serve as firebreaks.

Woodland group 7

This group consists of moderately well drained and somewhat poorly drained alluvial soils that consist of material washed from medium-textured upland soils. The slope is 0 to 2 percent. The surface layer is silt loam or sandy loam, and the subsoil is sandy loam or loam. The available water capacity is moderate. The soils are—

- Iuka soils.
- Iuka soils, local alluvium.
- Mantachie soils.
- Mantachie soils, local alluvium.
- Mantachie soils, overflow.

The stand capability type is hardwoods. Drainage and the natural supply of moisture affect the composition of the stand.

Cottonwood, cherrybark oak, white oak, water oak, willow oak, and yellow-poplar are the species most common in the native stands, and the ones to be favored in management. Cherrybark oak, ash, sweetgum, and swamp chestnut oak are to be preferred for planting in openings created by harvest cuttings. Loblolly pine is preferable for planting in fields that have been used recently for cultivated crops.

The potential productivity is excellent. The site index for sweetgum is 100±5 and that for cherrybark oak is 99±5. No data are available for other species.

Plant competition is moderate. Though competition develops, it does not generally prevent establishment of desirable species if sufficient openings are created in the marking and logging operations. The severe competition that develops after wildfire and in small openings is likely to prevent regeneration of desirable hardwoods for a number of years. Good management and intensive fire-control practices can prevent the need for costly site preparation.

Seedling mortality and the erosion hazard are slight and generally present no problems.

The windthrow hazard is moderate. There is little windthrow damage except during short periods of excessive wetness and high-velocity winds. Single large-crowned trees should not be left in openings or within a group of smaller trees.

The equipment limitation is moderate. The only restrictions are those caused by wetness, and only in unusually wet years do these restrictions last much more than 3 months.

Essential to management are suitably located and well-maintained access roads that also serve as firebreaks.

Woodland group 8

This is a group of somewhat poorly drained and poorly drained alluvial soils that consist of material washed from all types of upland soils of the county. The slope is 0 to 2 percent. The texture varies. The surface layer is loam, silt loam, or silty clay loam. The subsoil is silty clay, silty clay loam, loam, or silt loam. The available water capacity is moderate to low. These soils are—

- Chastain soils.
- Urbo silty clay loam.
- Waverly and Bibb soils.

The stand capability type is hardwood. The most commonly occurring species, and those to be favored in management, are ash, cypress, sweetgum, cherrybark oak, swamp chestnut oak, willow oak, water oak, and overcup oak.

Ash, sweetgum, cherrybark oak, and swamp chestnut oak are the species to be favored for planting in openings created by harvest cutting. For planting on cropland that is being converted to woodland, loblolly pine is preferable. An excellent stand of pine can be produced, but it will last through only one rotation. These are natural hardwood areas, and hardwoods will invade the pine stand after the first intermediate cutting. Regeneration of pines is not likely to be successful.

Potential productivity is very good. The site index is 94±5 for cherrybark oak and 90+5 for sweetgum. Information and methods of classifying variations in moisture and site are given in "Literature Cited" (*4*, *5*).

Plant competition is moderate. Though competition develops, it generally does not prevent establishment of desirable species if sufficiently large openings are created in logging operations. The severe competition that develops after wildfire and in small openings is likely to prevent regeneration of desirable hardwoods for a number of years. Good management and intensive fire-control practices can prevent the need for costly site preparation.

Seedling mortality is moderate. In wet years, standing water may kill seedlings in low areas. Care should be taken to prevent the formation of deep ruts that hold water and to avoid piling slash so that it restricts natural drainage.

The erosion hazard is slight and presents no problem.

The windthrow hazard is moderate to severe. Single trees should not be left in openings. Groups of six trees or more resist windthrow much better than do single trees in openings, or large, heavy-crowned trees within a group of smaller trees.

The equipment limitation is moderate to severe, because of wetness. Periods of more than 3 months during which the use of equipment is restricted are not uncommon.

Essential to management are suitably located and well-maintained access roads that also service as firebreaks.

Woodland group 9

This group consists of Dulac and Wilcox soils, mapped as complexes. The separate areas of these soils are so small and so intricately mixed that they cannot be shown separately at the scale of the soil map. The mapping units are—

- Dulac-Wilcox complex, 8 to 12 percent slopes.
- Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded.

Dulac soils are on ridgetops and upper slopes. They are moderately well drained. If uneroded, they consist of fine loamy material to a depth of about 38 inches. The lower part of this loamy material is a fragipan. Acid, plastic clay lies below a depth of about 38 inches. In severely eroded areas the layer of loam or silty clay loam over the subsoil is only 16 to 18 inches thick.

Wilcox soils are somewhat poorly drained. In uneroded areas the surface layer is silt loam and is 6 inches thick. Below this is acid, plastic clay. In eroded areas plastic clay is at the surface.

Uneroded areas of Dulac soils are suited to hardwoods, such as cherrybark oak, white oak, Shumard oak, and sweetgum. In uneroded areas of Wilcox soils, only the drainheads and lowest parts of slopes are suited to hardwoods. In general, no parts of the severely eroded complex are suited to hardwoods, except the narrow strip along draws, where the soil has accumulated and moisture is favorable, and the areas around drainheads. Loblolly pine (fig. 10) and shortleaf pine grow fairly well in all parts of these complexes. In uneroded areas the site index for loblolly pine is 75 to 85, and that for shortleaf pine is 65 to 75. In severely eroded areas the index for each species is 7 to 10 less.

Plant competition is moderate. Seedling mortality is generally slight, but it is moderate on the south-facing slopes of Wilcox soils. The erosion hazard ranges from slight on some areas of Dulac soils to severe on the eroded Wilcox soils. Establishing an effective cover on the eroded soils, after trees are removed, may require a number of years. The equipment limitation is slight or moderate on Dulac soils and is severe on Wilcox soils during wet weather.

Woodland group 10

This group consists of Wilcox and Cuthbert soils mapped as associations. The maping units are—

- Wilcox-Cuthbert association, moderately steep.
- Wilcox-Cuthbert association, moderately steep, severely eroded.
- Wilcox-Cuthbert association, steep.
- Wilcox-Cuthbert association, steep, severely eroded.

The slope range is 12 to 17 percent for the moderately steep associations and 17 to 45 percent for the steep associations. On some ridgetops the slope is less than 12 percent.

Wilcox soils are on the middle and lower slopes. They are somewhat poorly drained. In uneroded areas the surface layer is silt loam and is about 6 inches thick. The subsoil is acid, plastic clay. At a depth of about 30 inches is gray, partly weathered, acid shale.

Cuthbert soils are on ridgetops and upper slopes. They are moderately well drained. In uneroded areas the surface layer is fine sandy loam and is about 6 inches thick. It is underlain by plastic clay or sandy clay.

Figure 10.—A 5-year-old stand of loblolly pine on Dulac-Wilcox complex, 8 to 12 percent slopes.

Wilcox soils occupy a little more than half of these associations, and Cuthbert soils a little less than half. On ridgetops there are some small areas of the well-drained, more sandy Ruston soils. In eroded areas the present surface layer is clay. In the eroded areas of Wilcox soils the depth to shale is 18 to 24 inches or even less.

Although the soils of these associations are variable, loblolly pine and shortleaf pine grow fairly well everywhere. Hardwoods, such as white oak, Shumard oak, and sweetgum, grow well along the draws and around the drainheads. Loblolly pine is to be favored for planting.

In uneroded areas the site index for loblolly pine is 75 to 85, and that for shortleaf pine is 62 to 72. In severely eroded areas the index for each species is 5 to 15 less; it is lowest on the steepest soils. The small included areas of Ruston soils are more productive of pine than either Wilcox or Cuthbert soils.

Plant competition is generally slight or moderate. Seedling mortality is slight on the uneroded, moderately steep slopes and is moderate elsewhere. The erosion hazard ranges from slight to severe and is most severe on the steep, severely eroded slopes. The equipment limitation is moderate or severe, depending on the slope and degree of erosion.

Woodland group 11

This group consists of Ruston and Cuthbert soils, mapped as associations, and Ruston, Cuthbert, and Shubuta soils, mapped as associations. The mapping units are—

Ruston-Cuthbert association, moderately steep.
Ruston-Cuthbert association, moderately steep, eroded.
Ruston-Cuthbert association, steep.
Ruston-Cuthbert-Shubuta association, moderately steep, eroded.
Ruston-Cuthbert-Shubuta association, steep.

The slope range is 12 to 17 percent for the moderately steep associations, and 17 to 45 percent for the steep associations.

Ruston soils are on the ridgetops and upper slopes. They are deep, permeable, and well drained. The surface layer to a depth of 12 to 16 inches is loamy sand. Below that is friable sandy clay loam, and below that, at a depth of about 42 inches, is fine sandy loam.

Cuthbert soils are on the middle and lower slopes. If uneroded, they have a surface layer of fine sandy loam that is about 6 inches thick. This layer is underlain by plastic clay or firm sandy clay.

Shubuta soils, if uneroded, have a surface layer of loam that is 3 to 8 inches thick. Below this is slightly plastic clay loam that is 10 to 15 percent shale fragments. The content of shale increases below a depth of 38 inches.

Loblolly pine and shortleaf pine are the trees to be favored in management and for planting. White oak, Shumard oak, sweetgum, and yellow-poplar grow well along the drainageways and in coves. The site index for loblolly pine ranges from 75 to 86 on both Ruston and Shubuta soils, and from 72 to 75 on Cuthbert soils. The site index for shortleaf pine ranges from 72 to 76 on both Ruston and Shubuta soils, and from 57 to 60 on Cuthbert soils. The index is lowest on the steepest slopes. On the eroded soils the index for each species is somewhat lower than the foregoing values.

Plant competition is generally moderate. Seedling mortality ranges from slight for the Ruston soils to severe for the severely eroded Cuthbert soils. The erosion hazard is moderate or severe, depending on the slope and the degree of past erosion. The equipment limitation is moderate in most places, but it is severe in wet weather on the eroded soils. The windthrow hazard is moderate in exposed locations.

Woodland group 12

This group consists of gullied land in which the original well-drained to somewhat poorly drained soils can no longer be identified. The slope range is 5 to 45 percent. The root zone is deep in some places and shallow in many others.

The mapping units are –

Gullied land, clayey.
Gullied land, sandy.

Pine grows well in many locations. Both shortleaf pine and loblolly pine will grow, but loblolly pine (fig. 11) is to be preferred for both erosion control and wood production. The cast of needles from loblolly pine is about three times as great as that from shortleaf pine; consequently, loblolly pine gives the soils more protection and permits more rapid recovery of eroded soils. The site index for loblolly pine in a given location is about 10 higher than that for shortleaf pine. In general, Gullied land, sandy, is suitable for more rapid establishment and growth of pine trees than Gullied land, clayey.

No site-index ratings are assigned for these land types, because of the variations in soil material. A study of the yields of pine plantations established in the late 1930's show that these areas are good for the production of pine. Yields varied between ¾ and 1¾ cords per acre per year at 20 years of age. Though site did affect yields, stocking seemed to be the most important factor at 20 years. On the basis of this limited study it appears that, if 70 percent of the seedlings survive, a growth rate of ¾ to 1½ cords per acre per year can be expected in 20-year-old stands of loblolly pine. Under good forestry management, a growth rate of 1 to 1¾ cords per acre per year can be expected in stands that are between 20 and 30 years of age.

Short rotations for the production of cordwood are suitable. Increased yields and reduced risks are likely during the second rotation, because soil conditions improve and stability increases during the 30 or more years of the first rotation. If the forest is well managed, the second rotation can be obtained through natural regeneration.

Seedling mortality is moderate to severe. Within the actively eroding gullies, as much as 50 percent mortality can be expected the first 2 years. In the areas between gullies, though these areas are severely eroded, mortality is not likely to exceed 25 percent if seedlings are properly planted and rainfall is normal. Planting should be reinforced where needed the third year to insure efficient stocking and future yields.

Figure 11.—A 5-year-old stand of loblolly pine on Gullied land, sandy.

The erosion hazard is severe, and the equipment limitation is moderate to severe. In the large gullied areas, special equipment and logging methods are required. Excessive disturbance of the soil during logging should be avoided. Location of roads and loading areas should be considered from the standpoint of both erosion control and equipment care.

Windthrow is a moderate problem. Wide spacing of individual trees should be avoided until the stand has been lightly thinned at least twice and is at least 30 years old.

Woodland group 13

This group consists of two land types, one of which is subject to overflow. These land types lie in long, narrow bands along the large streams in the county. They are moderately well drained to somewhat poorly drained. The soil material consists of stratified layers of acid, sandy and silty alluvium. The natural fertility is low or medium. Permeability is variable. The mapping units are—

Mixed alluvial land.
Mixed alluvial land, overflow.

These land types cover about 5,000 acres. The stand capability type is hardwoods. Surface drainage and the available water capacity affect the composition of the stand.

The most commonly occurring species, and those to be favored in management, are cottonwood, cherrybark oak, white oak, water oak, willow oak, and yellow-poplar.

The species to be favored for planting vary according to past land use. Cottonwood grows well on recently cultivated fields. It needs to be cultivated the first year after planting. Loblolly pine also grows well on these soils, but after the first intermediate cutting the site will convert to hardwoods, and only one rotation of pine can be obtained. Cherrybark oak, yellow-poplar, or sweetgum can generally be planted successfully in the large openings that have been created by harvest cutting.

The potential productivity is excellent. No site-index values are available at the present time.

Plant competition is moderate. Though competition develops, it will not generally prevent establishment of desirable species if sufficient openings are created during the harvest operations. Severe competition may develop after wildfire and in small openings.

Seedling mortality and the erosion hazard are slight. The windthrow hazard is moderate. There is little damage from windthrow except during periods of extreme wetness and high winds. Leaving large-crowned trees exposed increases the hazard.

The equipment limitation is moderate to slight. The use of conventional equipment is seldom restricted for more than about 3 months.

Yields from Woodland

Yields from stands that are unmanaged, though fully stocked, are not considered a true measure of productivity. They do show, however, how the productivity of one site is related to that of another. Table 5 shows the growth in cumulative yield from unmanaged stands of loblolly pine and shortleaf pine.

TABLE 5.—*Stand and yield information for fully stocked, unmanaged, second-growth stands of loblolly pine and shortleaf pine*

[Statistics are compiled from United States Department of Agriculture Miscellaneous Publication No. 50. Absence of figure indicates that timber of specified size is not generally used for specified purpose. Yield figures are cumulative]

LOBLOLLY PINE

Site index	Age	Total merchantable volume per acre: More than 4 inches in diameter at breast height	Total merchantable volume per acre: More than 9 inches in diameter at breast height	Average diameter at breast height
	Years	*Cords of rough wood*	*Board feet (Doyle rule)*	
70	20	17	---	5.4
	30	31	1,000	7.8
	40	42	3,500	9.6
	50	50	6,500	10.9
	60	55	10,000	12.1
	70	59	12,500	13.0
	80	62	15,000	13.8
80	20	22	---	6.2
	30	38	2,000	8.7
	40	51	6,000	10.7
	50	60	11,500	12.2
	60	66	16,000	13.6
	70	70	19,500	14.6
	80	73	22,000	15.5
90	20	27	----	6.9
	30	46	4,000	9.6
	40	61	10,000	11.7
	50	71	16,500	13.6
	60	78	22,000	15.0
	70	82	26,000	16.2
	80	85	29,000	17.2
100	20	32	500	7.4
	30	53	6,000	10.4
	40	71	14,500	12.8
	50	84	23,000	14.7
	60	92	29,500	16.2
	70	96	33,000	17.6
	80	100	35,500	18.6

TABLE 5.—*Stand and yield information for fully stocked, unmanaged, second-growth stands of loblolly pine and shortleaf pine*—Continued

SHORTLEAF PINE

Site index	Age	Total merchantable volume per acre: More than 4 inches in diameter at breast height	Total merchantable volume per acre: More than 9 inches in diameter at breast height	Average diameter at breast height
	Years	*Cords of rough wood*	*Board feet (Doyle rule)*	
60	20	12	---------	----------
	30	32	---	5.7
	40	46	1,550	7.3
	50	54	4,350	8.4
	60	60	7,600	9.7
	70	65	10,250	10.6
	80	68	12,700	11.4
70	20	18	---	4.5
	30	41	750	6.6
	40	56	4,000	8.4
	50	66	8,650	9.8
	60	73	12,600	11.0
	70	79	16,250	12.0
	80	83	19,400	12.8
80	20	25		5.2
	30	48	1,950	7.5
	40	65	7,650	9.5
	50	77	13,550	11.1
	60	85	18,850	12.3
	70	92	23,450	13.3
	80	97	27,550	14.2
90	20	30	---	6.1
	30	54	4,550	8.8
	40	73	12,600	10.9
	50	87	20,450	12.6
	60	98	27,400	14.0
	70	105	32,850	15.2
	80	112	37,400	16.2

Use of Soils for Engineering

This section deals with soil as construction material. It explains the physical and chemical properties of the soils as they affect the design and construction of highways and of conservation and sanitation structures.

Important steps in soil engineering are to identify different kinds of soils and locate them on the soil map, to determine their engineering properties, to correlate their properties with the requirements of the job, and to select the best material for each job.

Information in this report can be used to—

1. Make soil and land use studies that will aid in the selection and development of industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the soil properties that are significant in designing drainage and irrigation structures and in planning dams and other soil and water conservation structures.

3. Make preliminary evaluations of soil and ground conditions that will aid in the selection of highway, pipeline, and airport locations.
4. Locate sources of sand for use in structures.
5. Correlate performance of engineering structures with soil mapping units, and thus develop information that will be useful in designing and maintaining the structure.
6. Determine the suitability of soils for the cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs to make maps and reports that can be used readily by engineers.

With the soil map for identification of soil areas, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that these interpretations may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Generally, soils must be used in the locality where they occur. At many construction sites there are major soil variations within the depth of proposed excavations, and several different soils may occur within short distances. If maps, descriptions, and other data contained in this report are used to plan detailed soil investigations at construction sites, a minimum number of soil samples will be needed for laboratory testing. After testing the soils and observing their behavior in place, under varying conditions, engineers should be able to anticipate to a reasonable degree the properties of the different kinds of soils wherever they are mapped.

Brief descriptions of the soils in Tippah County and estimates of properties that are significant in engineering are given in table 6. The soil characteristics affecting design and construction of engineering works are shown in table 7. These characteristics are evaluated on the basis of estimates in table 6, of test data in table 8, and of field observations.

Other parts of this report also may be helpful to engineers, particularly the section "Descriptions of Soils." Some of the terms that are used by soil scientists but that may be unfamiliar to engineers are defined in the Glossary.

Engineering Classification Systems

Most highway engineers classify soil materials according to the system approved by the American Association of State Highway Officials (*1*). In this system soil materials are classified in seven principal groups. The groups range from A-1, in which are gravelly soils of high bearing capacity, to A-7, which consists of clay soils having low strength and stability when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number, which is shown in parentheses after the soil group symbol. Group index numbers range from 0 for the best materials to 20 for the poorest.

Some engineers prefer to use the Unified soil classification system (*17*). In this system, the soil material is identified as coarse grained (eight classes), fine grained (six classes), and highly organic.

Table 6 gives the estimated classification for all the soils of the county according to each system. Table 8 gives the classification, including group index numbers in the AASHO system, for those soils that were tested.

Soil Test Data

To help evaluate the soils for engineering purposes, samples from four profiles of three extensive soil series were tested in accordance with standard procedures.[4] The results of these tests are given in table 8. The test data show some variations in characteristics but probably do not show the entire range of variations in the lower horizons. The data therefore may not be adequate for estimating characteristics of soil material in deep cuts on rolling topography.

The engineering soil classifications in table 8 are based on data obtained by mechanical analysis and by tests made to determine the liquid limit and the plastic limit. The mechanical analysis was made by combined sieve and hydrometer methods. The liquid limit and plastic limit tests measure the effect of moisture on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which soil material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the plastic limit and the liquid limit.

If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed maximum dry density. Moisture-density data are important in earthwork, for the soil is most stable if it is compacted to the maximum dry density when it is at the optimum moisture content.

Conservation Engineering

This subsection describes the most important conservation engineering measures used in Tippah County and explains their basic design and construction.

Drainage.—Most of the bottom-land soils of the county need a complete system of drainage. The system may include properly arranged rows, V-type or W-type ditches, mains and laterals, and outlets.

[4] Test data for Collins silt loam, BPR report number 88996, are in the De Soto County, Miss., Soil Survey Report. Data for two profiles of Ora silt loam, Mississippi State Highway Laboratory numbers 402249 and 402252, are in the Monroe County, Miss., Soil Survey Report.

TABLE 6.—*Brief descriptions of soils and their*

[No descriptions are given for Mixed alluvial land and Mixed alluvial land, overflow, both of which are on bottom

Map symbol	Soil	Description of soil and site	Depth from surface	Classification: USDA texture
			In.	
Ao	Almo silt loam.	About 6 inches of friable silt loam over 1½ feet of heavy silt loam over a compact and brittle fragipan of silty clay loam, 6 inches thick, that is underlain by several feet of slightly plastic heavy silty clay loam; formed on low, nearly level stream terraces in loess and Coastal Plain material; seasonally high water table at or near the surface; 0 to 2 percent slopes.	0 to 7 7 to 22 22 to 28 28 to 60+	Silt loam Silt loam Silty clay loam Silty clay loam
AtB2 AtB3 AtC3 AtD3	Atwood silt loam, 2 to 5 percent slopes, eroded. Atwood silt loam, 2 to 5 percent slopes, severely eroded. Atwood silt loam, 5 to 8 percent slopes, severely eroded. Atwood silt loam, 8 to 12 percent slopes, severely eroded.	About 6 inches of friable silt loam over 5 feet or more of silty clay loam; formed on sloping ridgetops and upper side slopes in loess and Coastal Plain material; seasonally high water table at a depth of 5 to 20 feet.	0 to 6 6 to 60	Silt loam Silty clay loam
BuA BuB BuB2	Bude silt loam, 0 to 2 percent slopes. Bude silt loam, 2 to 5 percent slopes. Bude silt loam, 2 to 5 percent slopes, eroded.	About 6 inches of friable silt loam over 1½ feet of heavy silt loam over a compact and brittle fragipan of heavy silt loam, 2 feet thick, that is underlain by several feet of clay loam; formed in thin loess on the uplands; less than 4 feet thick over medium-textured to fine-textured Coastal Plain material, seasonally high water table at a depth of 6 inches to 1½ feet.	0 to 7 7 to 24 24 to 46 46 to 62	Silt loam Silt loam Silt loam Clay loam
Ch	Chastain soils.	About 6 inches of friable heavy silt loam over 4 feet of silty clay that is underlain by several feet of clay loam; formed on the bottom lands in fine-textured Coastal Plain alluvium; seasonally high water table at or near the surface; 0 to 2 percent slopes.	0 to 5 5 to 51 51 to 60+	Silt loam Silty clay Clay loam
Cn	Collins silt loam.	More than 4 feet of friable silt loam; formed on the bottom lands in medium-textured alluvium derived from loess; seasonally high water table at a depth of 1½ to 2½ feet; 0 to 2 percent slopes.	0 to 6 6 to 42+	Silt loam Silt loam
Co	Collins silt loam, local alluvium.	More than 4 feet of friable silt loam; formed on the bottom lands in medium-textured, unconsolidated alluvium derived from loess; seasonally high water table at a depth of 1½ to 2½ feet; 0 to 3 percent slopes.	0 to 6 6 to 42+	Silt loam Silt loam
DuB2 DuB3 DuC3	Dulac silt loam, 2 to 5 percent slopes, eroded. Dulac silt loam, 2 to 5 percent slopes, severely eroded. Dulac silt loam, 5 to 8 percent slopes, severely eroded.	About 6 inches of friable silt loam over about 1½ feet of silty clay loam over a fragipan, 1½ feet thick, that impedes internal drainage; underlain by 2 feet or more of fine-textured Coastal Plain clay; formed on the uplands in loess and Coastal Plain material; seasonally high water table at a depth of 1½ to 2½ feet.	0 to 5 5 to 23 23 to 38 38 to 60	Silt loam Silty clay loam Silt loam Clay
DwD DwD3	Dulac-Wilcox complex, 8 to 12 percent slopes. Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded.	Wilcox part of complex consists of about 6 inches of friable silt loam over about 2 feet of plastic clay that impedes internal drainage; underlain by about 1 foot of partially weathered clay shale; formed on the uplands in Coastal Plain clay shale. See description of Dulac silt loams for Dulac part of complex.	0 to 6 6 to 30 30 to 40	Silt loam Clay Clay shale
Fa	Falaya silt loam.	4 feet or more of friable silt loam; formed on the bottom lands in medium textured alluvium derived from loess; seasonally high water table at a depth of ½ to 1½ feet; 0 to 2 percent slopes.	0 to 55+	Silt loam
Fc	Falaya silt loam, local alluvium.	4 feet or more of friable silt loam; formed on the bottom lands in medium-textured, unconsolidated alluvium derived from loess; seasonally high water table at a depth of ½ to 1½ feet; 0 to 3 percent slopes.	0 to 55	Silt loam
Ff	Falaya silt loam, overflow.	4 feet of friable silt loam; formed on the bottom lands in alluvium derived from loess; seasonally high water table at a depth of ½ to 1½ feet; usually flooded several times each year.	0 to 55	Silt loam

estimated physical and chemical properties

lands and vary so much in texture that they are obviously unsuitable for engineering purposes]

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
Unified	AASHO	No. 4	No. 10	No. 200					
					In. per hr.	*In. per in. of depth*	*pH*		
ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	4.5 to 5.5	High	Low.
CL	A-4 or A-6	100	100	90 to 100	0.8 to 2.50	0.24	4.5 to 5.5	High	Low.
CL	A-6 or A-7	100	100	85 to 95	0.0 to 0.05	0.06	4.8 to 5.8	Moderate	Low.
CL	A-6 or A-7	100	100	85 to 95	0.8 to 2.50	0.25	4.8 to 5.8	Moderate	Moderate.
ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 6.0	High	Low.
CL or CH	A-7	100	100	90 to 100	0.8 to 2.50	0.26	5.0 to 6.0	Moderate	Moderate.
ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
ML or CL	A-4	100	100	90 to 100	0.8 to 2.50	0.25	4.5 to 5.5	Moderate to high.	Low to moderate.
ML or CL	A-6 or A-7	100	100	85 to 95	0.0 to 0.05	0.06	5.0 to 5.5	Moderate	Low.
CL or CH	A-7	100	100	70 to 80	0.2 to 0.80	0.19	5.0 to 5.5	Moderate	Moderate.
ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.1 to 5.5	High	Low.
CH	A-7	100	100	90 to 100	0.05 to 0.20	0.28	5.1 to 5.5	Low to moderate.	Moderate to high.
CL	A-6	100	100	60 to 80	0.20 to 0.80	0.20	5.1 to 5.5	Moderate	Moderate.
ML or ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.5 to 6.0	High	Low.
ML or ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.5 to 6.0	High	Low.
ML or ML-CL	A-4	100	100	90 to 100	0.8 to 2.50		5.5 to 6.0	High	Low.
ML or ML-CL	A-4	100	100	90 to 100	0.8 to 2.50		5.5 to 6.0	High	Low.
ML-CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
CL	A-6 or A-7	100	100	90 to 100	0.2 to 0.80	0.24	4.5 to 5.2	Moderate	Moderate.
ML-CL	A-4	100	100	90 to 100	0.0 to 0.05	0.06	4.5 to 5.2	Moderate	Low.
CH	A-7	100	100	80 to 90	0.0 to 0.05	0.26	4.5 to 5.2	Low	High.
ML	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
CH	A-7	100	100	90 to 100	0.05 to 0.20	0.23	4.5 to 5.0	Low	High.
ML or ML-CL	A-4 or A-6	100	100	90 to 100	0.8 to 2.50	0.25 to 0.28	5.0 to 6.0	High	Low to moderate.
ML or ML-CL	A-4 or A-6	100	100	90 to 100	0.8 to 2.50	0.25 to 0.28	5.0 to 6.0	High	Low to moderate.
ML or ML-CL	A-4 or A-6	100	100	90 to 100	0.8 to 2.50	0.25 to 0.28	5.0 to 6.0	High	Low to moderate.

TABLE 6. *Brief descriptions of soils and their*

Map symbol	Soil	Description of soil and site	Depth from surface	Classification
				USDA texture
			In.	
FkA	Falkner silt loam, 0 to 2 percent slopes.	About 6 inches of friable silt loam over about 1 foot of silty clay loam; underlain by a layer of clay that formed in fine-textured Coastal Plain material that is more than 4 feet thick and that impedes internal drainage; formed on the uplands in loess; seasonally high water table at a depth of 1 to 1½ feet.	0 to 6	Silt loam
FkB2	Falkner silt loam, 2 to 5 percent slopes, eroded.		6 to 18	Light silty clay loam.
FkB3	Falkner silt loam, 2 to 5 percent slopes, severely eroded.		18 to 61+	Clay
FkC2	Falkner silt loam, 5 to 8 percent slopes, eroded			
FkC3	Falkner silt loam, 5 to 8 percent slopes, severely eroded.			
FrB2	Freeland silt loam, 2 to 5 percent slopes, eroded.	About ½ foot of friable silt loam over 2 feet of heavy silt loam over a compact and brittle fragipan of silt loam, 1 foot thick; underlain by several feet of loam; formed on terraces in loess and Coastal Plain material; seasonally high water table at a depth of 1½ to 3 feet.	0 to 7 7 to 27 27 to 40 40 to 56	Silt loam Silt loam Silt loam Loam
Gc Gn	Gullied land, clayey. Gullied land, sandy.	Areas of such variable texture and so severely eroded that profile cannot be described; gullies are 3 to 20 feet deep and 3 to 50 feet wide; 5 to 45 percent slopes.		
HaA	Hatchie silt loam, 0 to 2 percent slopes.	About 6 inches of friable silt loam over 1 foot of heavier silt loam over a compact and brittle fragipan of silt loam, about 1 foot thick, underlain by several feet of silt loam; formed on terraces in loess mixed with Coastal Plain material; seasonally high water table at a depth of ½ to 1½ feet.	0 to 6 6 to 19	Silt loam Silt loam
HaB	Hatchie silt loam, 2 to 5 percent slopes.		19 to 31 31 to 44+	Silt loam Silt loam
Ik	Iuka soils.	More than 5 feet of very friable fine sandy loam; formed on bottom land in coarse-textured Coastal Plain alluvium; seasonally high water table at a depth of 1½ to 2½ feet; 0 to 2 percent slopes.	0 to 55+	Fine sandy loam
Iu	Iuka soils, local alluvium.	More than 5 feet of very friable fine sandy loam; formed on bottom land in unconsolidated, coarse-textured Coastal Plain material; seasonally high water table at a depth of 1½ to 2½ feet; 0 to 3 percent slopes; pH 5.1 to 5.5.	0 to 55+	Fine sandy loam
Ma	Mantachie soils.	About 6 inches of friable silt loam over several feet of loam; formed on bottom lands in coarse-textured Coastal Plain alluvium; seasonally high water table at a depth of ½ to 1½ feet; 0 to 2 percent slopes.	0 to 7 7 to 51+	Silt loam Loam
Mc	Mantachie soils, local alluvium.	About 6 inches of friable silt loam over several feet of loam; formed on bottom lands in coarse-textured, unconsolidated Coastal Plain material; seasonally high water table at a depth of ½ to 1½ feet; 0 to 3 percent slopes.	0 to 7 7 to 51+	Silt loam Loam
Mf	Mantachie soils, overflow.	About 6 inches of friable silt loam over several feet of loam; formed on bottom lands in coarse-textured Coastal Plain alluvium; seasonally high water table at a depth of ½ to 1½ feet; usually flooded several times each year.	0 to 7 7 to 51+	Silt loam Loam
OrB3	Ora loam, 2 to 5 percent slopes, severely eroded.	About 6 inches of friable silt loam or loam over 2 feet of heavy loam or clay loam over a compact and brittle fragipan of sandy loam that is about 2 feet thick and impedes internal drainage; underlain by several feet of sandy clay loam; formed on uplands in coarse-textured Coastal Plain material, seasonally high water table at a depth of 1½ to 2½ feet.	0 to 6	Silt loam
OrC3	Ora loam, 5 to 8 percent slopes, severely eroded.		6 to 28 28 to 52	Clay loam Sandy loam
OrD3	Ora loam, 8 to 12 percent slopes, severely eroded.		52 to 60+	Sandy clay loam
OsB2	Ora silt loam, 2 to 5 percent slopes, eroded.			
OsC2	Ora silt loam, 5 to 8 percent slopes, eroded.			

estimated physical and chemical properties—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
Unified	AASHO	No. 4	No. 10	No. 200					
					In. per hr.	*In. per in. of depth*	*pH*		
ML–CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
CL or CH	A-7	100	100	90 to 100	0.8 to 2.50	0.25	4.5 to 5.5	Moderate	Moderate.
CH	A-7	100	100	90 to 100	0.0 to 0.05	0.26	4.5 to 5.5	Low	High.
ML–CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
CL	A-4	100	100	90 to 100	0.8 to 2.50	0.24	4.5 to 5.0	High	Low.
CL	A-4	100	100	80 to 90	0.0 to 0.05	0.06	5.0 to 5.5	Moderate	Low.
CL	A-4 A-6	100	100	60 to 70	0.8 to 2.50	0.15	5.0 to 5.5	Moderate	Low.
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ML or ML–CL	A-4	100	100	100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low.
CL	A-6	100	100	90 to 100	0.8 to 2.50	0.24	4.5 to 5.0	High	Low.
CL	A-6	100	100	100	0.0 to 0.05	0.06	5.0 to 5.5	High	Low.
CL	A-6	100	100	100	0.8 to 2.50	0.26	5.0 to 5.5	High	Low to moderate.
SM or ML	A-4	100	100	45 to 55	0.8 to 2.50	0.14	5.1 to 5.5	High	Low.
SM or ML	A-4	100	100	45 to 55	0.8 to 2.50	0.14	5.1 to 5.5	High	Low.
ML	A-4	100	100	70 to 90	0.8 to 2.50	0.19	5.0 to 5.5	High	Low.
ML	A-4	100	100	60 to 70	0.8 to 2.50	0.15	5.0 to 5.5	High	Low.
ML	A-4	100	100	70 to 90	0.8 to 2.50	0.19	5.0 to 5.5	High	Low.
ML	A-4	100	100	60 to 70	0.8 to 2.50	0.15	5.0 to 5.5	High	Low.
ML	A-4	100	100	70 to 90	0.8 to 2.50	0.19	5.0 to 5.5	High	Low.
ML	A-4	100	100	60 to 70	0.8 to 2.50	0.15	5.0 to 5.5	High	Low.
ML–CL	A-6	100	100	76	0.8 to 2.50	0.13	5.1 to 5.5	High	Low.
CL	A-6	100	100	73	0.8 to 2.50	0.16	5.1 to 5.5	Moderate	Moderate.
ML–CL	A-4	100	100	63	0.8 to 2.00	0.14	5.1 to 5.5	Low to moderate.	Low.
CL	A-6	100	100	55 to 65	0.8 to 2.50	0.15	4.5 to 5.0	Moderate	Moderate.

TABLE 6.—*Brief descriptions of soils and their*

Map symbol	Soil	Description of soil and site	Depth from surface	Classification
				USDA texture
			In.	
PdB2 PdB3 PdC2 PdC3 PdD3	Providence silt loam, 2 to 5 percent slopes, eroded. Providence silt loam, 2 to 5 percent slopes, severely eroded. Providence silt loam, 5 to 8 percent slopes, eroded. Providence silt loam, 5 to 8 percent slopes, severely eroded. Providence silt loam, 8 to 12 percent slopes, severely eroded.	About 6 inches of friable silt loam over 1½ feet of silty clay loam over a compact and brittle fragipan of silt loam that is about 1 foot thick and impedes internal drainage; underlain by several feet of light clay loam; formed on uplands in loess and coarse-textured Coastal Plain material; seasonally high water table at a depth of 1½ to 2½ feet.	0 to 8 8 to 27 27 to 36 36 to 58+	Silt loam Silty clay loam Silt loam Clay loam
RnE RnE2 RnF	Ruston soils, 12 to 17 percent slopes. Ruston soils, 12 to 17 percent slopes, eroded. Ruston soils, 17 to 45 percent slopes.	About 1½ feet of very friable loamy sand over 2½ feet of sandy clay loam underlain by sandy loam; formed on uplands on narrow ridgetops and side slopes in coarse-textured Coastal Plain material; seasonally high water table at a depth of 5 to 20 feet.	0 to 16 16 to 44 44 to 72	Loamy sand Sandy clay loam Sandy loam
RsE RsE2 RsF	Ruston-Cuthbert association, moderately steep. Ruston-Cuthbert association, moderately steep, eroded. Ruston-Cuthbert association, steep.	Cuthbert part of association consists of about 6 inches of very friable fine sandy loam over about 1½ feet of plastic clay; underlain by about 2½ feet of plastic sandy clay; formed on uplands in fine-textured, stratified Coastal Plain material; slope is more than 12 percent. See description of Ruston soils for Ruston part of association.	0 to 6 6 to 25 25 to 56	Fine sandy loam Clay Sandy clay stratified with coarse material.
RuE2 RuF	Ruston-Cuthbert-Shubuta association, moderately steep, eroded. Ruston-Cuthbert-Shubuta association, steep.	Shubuta part of association consists of about 7 inches of friable loam over about 2½ feet of slightly plastic clay loam, 10 percent of which consists of clay shale fragments; underlain by about 2 feet of slightly plastic clay loam that is about 15 percent clay shale fragments; formed on steep and very steep hillsides and narrow ridges in stratified Coastal Plain clay loam, clay, and clay shale. See description of Ruston soils for Ruston part of association. See description of Ruston-Cuthbert associations for Cuthbert part of association.	0 to 7 7 to 36 36 to 60	Loam Clay loam Clay loam
Tc	Tickfaw silt loam	6 inches of friable silt loam over 1½ feet of silty clay loam that impedes internal drainage; underlain by several feet of silty clay; formed on uplands in loess and Coastal Plain material; seasonally high water table at or near the surface; 0 to 2 percent slopes.	0 to 6 6 to 24 24 to 60+	Silt loam Silty clay loam Silty clay
Ur	Urbo silty clay loam.	About 1 foot of silty clay loam over 1½ feet of silty clay that impedes internal drainage; underlain by several feet of silty clay loam; formed on bottom lands in fine-textured Coastal Plain alluvium; seasonally high water table at a depth of ½ to 1½ feet; 0 to 2 percent slopes.	0 to 10 10 to 25 25 to 42+	Sily clay loam Silty clay Silty clay loam
Wb	Waverly and Bibb soils.	About 1 foot of friable loam or silt loam over several feet of loam or silty clay loam; formed on bottom lands in loess and Coastal Plain alluvium; seasonally high water table at or near the surface; 0 to 2 percent slopes.	0 to 10 10 to 48+	Loam or silt loam. Loam or silty clay loam.
WcE WcE3 WcF WcF3	Wilcox-Cuthbert association, moderately steep. Wilcox-Cuthbert association, moderately steep, severely eroded. Wilcox-Cuthbert association, steep. Wilcox-Cuthbert association, steep, severely eroded.	See description of Dulac-Wilcox complexes for Wilcox part of association. See description of Ruston-Cuthbert associations for Cuthbert part of association.		

estimated physical and chemical properties –Continued

Classification—Continued: Unified	Classification—Continued: AASHO	Percentage passing sieve—: No. 4	No. 10	No. 200	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					In. per hr.	*In. per in. of depth*	*pH*		
ML–CL	A–4	100	100	90 to 100	0.8 to 2.50	0.26	5.0 to 5.5	High	Low.
CL	A–6 or A–7	100	100	90 to 100	0.8 to 2.50	0.28	4.8 to 5.2	Low	Moderate.
ML or CL	A–4 or A–6	100	100	90 to 100	0.2 to 0.80	0.18	5.0 to 5.5	Moderate	Low.
CL	A–6	100	100	60 to 80	0.2 to 0.80	0.16	5.0 to 5.5	Moderate	Low to moderate.
SM	A 2	100	100	15 to 25	2.5 to 5.00	0.13	5.1 to 5.5	High	Low.
SC	A–6	100	100	43	2.5 to 5.00	0.14	5.1 to 5.5	Moderate	Low.
SM	A–2 or A–4	100	100	30 to 40	2.5 to 5.00	0.13	4.5 to 5.0	High	Low.
SM	A–4	100	100	36 to 45	2.5 to 5.00	0.13	4.5 to 5.5	High	Low.
CH	A 7	100	100	85 to 95	0.2 to 0.50	0.17	5.0 to 5.5	Low	High to moderate.
CL	A–6 or A–7	100	100	65 to 75	0.2 to 0.80	0.15	5.0 to 5.5	Low	Moderate.
SM	A–4	100	100	40 to 50	0.8 to 2.50	0.15	5.0 to 5.5	High	Low.
CL or CH	A–7	100	100	75 to 85	0.2 to 0.80	0.19	5.0 to 5.5	Moderate	Moderate.
CL	A 6	100	100	70 to 80	0.8 to 2.50	0.17	4.5 to 5.0	Moderate	Moderate to low.
ML	A–4	100	100	90 to 100	0.8 to 2.50	0.24	5.0 to 5.5	High	Low to moderate.
CL	A–6 or A–7	100	100	90 to 100	0.8 to 2.50	0.26	4.5 to 5.0	Moderate to low.	Moderate.
CH	A–7	100	100	90 to 100	0.05 to 0.20	0.21	4.0 to 5.0	Low	High.
CL	A–6 or A–7	100	100	85 to 95	0.8 to 2.50	0.18	5.1 to 5.5	Moderate	Moderate.
CH	A–7	100	100	80 to 100	0.2 to 0.80	0.28	5.0 to 5.5	Low	High.
CL	A 6 or A–7	100	100	85 to 95	0.8 to 2.50	0.18	5.0 to 5.5	Moderate	Moderate.
CL	A–6 or A–7	100	100	90 to 100	0.2 to 0.80	0.20	4.5 to 5.5	High	Moderate.
CL or CH	A–6 or A–7	100	100	90 to 100	0.05 to 0.20	0.21	4.5 to 6.0	Moderate	Moderate.

TABLE 7.—*Engineering*

[For interpretations of the soils that make up a complex, an association, or an undifferentiated unit, it is necessary to refer to the respective

Soil series and map symbols	Suitability as source of—			Soil features affecting	
	Topsoil	Sand	Road fill	Highway location	Dikes or levees
Almo (Ao).	Fair to depth of 1½ to 2 feet.	Not suitable	Fair; easily eroded	High water table; fragipan impedes internal drainage.	Poor to fair suitability.
Atwood (AtB2, AtB3, AtC3, AtD3).	Fair to good	Not suitable	Fair; easily eroded	Slopes easily eroded; low to moderate shrink-swell potential.	Low to moderate shrink-swell potential; poor to fair stability.
Bibb (Wb).	Poor	Not suitable	Poor to fair; poor strength and stability; moderate shrink-swell potential; slow permeability.	High water table; frequent flooding; slow permeability.	Poor strength and stability; slow permeability; high shrink-swell potential.
Bude (BuA, BuB, BuB2).	Fair to depth of 1½ to 2 feet.	Not suitable	Fair; easily eroded	High water table; fragipan impedes internal drainage.	Poor to fair stability; low shrink-swell potential.
Chastain (Ch)	Poor	Not suitable	Poor; cracks when dry.	Soil material shrinks and swells; frequent floods.	Moderate to high shrink-swell potential.
Collins (Cn, Co).	Good	Not suitable	Fair; easily eroded	Occasional floods	Poor to fair stability; low shrink-swell potential.
Cuthbert (RsE, RsE2, RsF, RuE2, RuF, WcE, WcE3, WcF, WcF3).	Poor	Poor	Fair	Seepage; moderate shrink-swell potential.	Moderate shrink-swell potential.
Dulac (DuB2, DuB3, DuC3, DwD, DwD3)	Fair to depth of 1½ to 2 feet.	Not suitable	Fair to poor; easily eroded; cracks when dry.	Plastic subsoil; moderate to high shrink-swell potential.	Moderate to high shrink-swell potential.
Falaya (Fa, Fc, Ff).	Good	Not suitable	Fair; easily eroded	Occasional floods	Poor to fair stability; low shrink-swell potential.
Falkner (FkA, FkB2, FkB3, FkC2, FkC3).	Fair to depth of 1½ to 2 feet.	Not suitable	Fair to poor; underlying material easily eroded; cracks when dry.	Clay impedes internal drainage; easily eroded; plastic underlying material.	Low to high shrink-swell potential.
Freeland (FrB2).	Fair to depth of 1½ to 2 feet.	Not suitable	Fair; easily eroded	Fragipan impedes internal drainage; easily eroded.	Low to moderate shrink-swell potential.
Hatchie (HaA, HaB).	Fair to depth of 1½ to 2 feet.	Not suitable	Fair; easily eroded	High water table; fragipan impedes internal drainage.	Poor to fair stability; low shrink-swell potential.
Iuka (Ik, Iu).	Good to depth of water table.	Poor	Fair; fair strength and stability; erodible side slopes.	Seasonally high water table; subject to flooding.	Fair strength and stability.
Mantachie (Ma, Mc, Mf).	Good to depth of water table.	Poor	Fair; fair strength and stability; erodible side slopes.	Seasonally high water table; subject to flooding.	Poor strength and stability; slopes erodible.

interpretations

series. Interpretations are not given for the miscellaneous land types, which are highly variable and require on-site investigation]

Soil features affecting—Continued						
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Limitations for use as sewage-disposal fields
Reservoir area	Embankment					
Slow seepage rate	Poor to fair strength and stability.	Perched water table, needs surface drainage.	Slow intake rate; shallow root zone.	Not needed	Low to moderate water-holding capacity; shallow root zone.	Very severe; poor drainage; fragipan.
Slow seepage rate	Poor to fair strength and stability.	Not needed	High water-holding capacity; slow intake rate	Soil properties favorable except on steep slopes.	High water-holding capacity; moderate fertility; grows good sod.	Moderate to slight; well-drained uplands; moderate internal drainage.
Slow seepage rate; subject to flooding.	Poor strength and stability; high shrink-swell potential.	Limited outlets; slow permeability; high water table.	Slow intake rate; slow permeability; moderate water-holding capacity.	Not needed	Not needed	Very severe; high water table.
Slow seepage rate	Poor to fair strength and stability.	Perched water table, needs surface drainage.	Slow intake rate; shallow root zone.	Soil properties favorable.	Moderate to low water-holding capacity; shallow root zone.	Severe; perched water table; fragipan.
Slow seepage rate; subject to flooding.	Cracks when dry.	Very slowly permeable; needs surface drainage.	High water-holding capacity; slow intake rate.	Not needed	High water holding capacity; moderate fertility; grows good sod.	Very severe; flooding; plastic clay.
Slow seepage rate; subject to flooding	Poor strength and stability.	Needs surface drainage.	High water-holding capacity; slow intake rate.	Not needed	High water-holding capacity, moderate fertility; grows good sod.	Severe; occasional flooding.
Slow permeability	Fair to good strength and stability.	Not needed	Moderate to slow intake rate.	Soil properties favorable.	Moderate water-holding capacity.	Severe; slow percolation.
Slow seepage rate; will support deep water.	Cracks when dry.	Not needed	Slow intake rate; moderate to high water-holding capacity.	Soil properties favorable except on steep slopes.	Moderate to high water-holding capacity; low fertility.	Severe; dense, plastic clay subsoil.
Slow seepage rate; subject to flooding.	Poor to fair strength and stability.	Needs surface drainage.	High water-holding capacity; slow intake rate.	Not needed	High water-holding capacity; moderate fertility.	Moderate; occasional flooding.
Slow seepage rate; will support deep water.	Poor to fair strength and stability.	Nearly level; perched water table; needs surface drainage.	Slow intake rate; shallow root zone.	Soil properties favorable.	Moderate water-holding capacity; shallow root zone.	Severe; perched water table.
Slow seepage rate; will support deep water; some areas subject to flooding.	Poor to fair strength and stability.	Not generally needed.	Moderate water-holding capacity; slow intake rate.	Soil properties favorable.	Moderate water-holding capacity; fragipan limits root zone.	Moderate to severe; fragipan impedes internal drainage.
Slow seepage rate; some areas subject to flooding.	Poor to fair strength and stability.	Perched water table; needs surface drainage.	Slow intake rate; shallow root zone.	Soil properties favorable.	Moderate to low water-holding capacity; shallow root zone.	Severe; perched water table; fragipan.
Some seepage; areas subject to flooding.	Poor to fair strength and stability.	High water table; needs surface drainage.	Moderate intake rate; moderate water-holding capacity.	Not needed	Natural waterways grow good sod.	Severe; subject to overflow.
Some seepage; areas subject to flooding.	Poor to fair strength and stability.	Seasonally high water table; needs surface drainage.	Moderate intake rate; moderate water-holding capacity.	Not needed	Natural waterways grow good sod.	Severe; subject to overflow.

TABLE 7.—*Engineering*

Soil series and map symbols	Suitability as source of—			Soil features affecting—	
	Topsoil	Sand	Road fill	Highway location	Dikes or levees
Ora (OrB3, OrC3, OrD3, OsB2, OsC2).	Surface layer good; fair to depth of 2 feet.	Substratum fair to good for road subbase.	Fair to good; easily eroded.	Seasonally high water table; fragipan impedes internal drainage.	Poor strength and stability; slopes erodible.
Providence (PdB2, PdB3, PdC2, PdC3, PdD3).	Surface layer good.	Poor	Fair; fair to poor strength and stability.	Seasonally high water table; fragipan at depth of 2 feet.	Poor strength and stability; slopes erodible.
Ruston (RnE, RnE2 RnF, RsE, RsE2, RsF, RuE2, RuF).	Fair to good	Fair in local areas.	Fair to good; fair strength and stability.	Soil properties favorable.	Fair strength and stability.
Shubuta (RuE2, RuF).	Surface layer fair.	Poor	Poor to fair strength and stability; slopes highly erodible.	High shrink-swell potential.	Fair strength and stability; slopes erodible.
Tickfaw (Tc).	Surface layer good.	Not suitable	Poor; unstable; slow permeability; high shrink-swell potential below 2 feet.	High water table; slow permeability.	Poor strength and stability.
Urbo (Ur).	Surface layer good.	Not suitable	Poor; unstable; slow permeability; high shrink-swell potential below 10 inches.	High water table; slow permeability.	Unstable; high water table; high shrink-swell potential.
Waverly (Wo).	Poor	Not suitable	Poor to fair; poor strength and stability; moderate shrink-swell potential; slow permeability.	High water table; frequent flooding; slow permeability.	Poor strength and stability; slow permeability; high shrink-swell potential.
Wilcox (DwD, DwD3, WcE, WcE3, WcF, WcF3).	Surface layer fair.	Poor in local areas.	Poor; poor strength; high shrink-swell potential; slow permeability.	High water table; slow permeability; heavy clay or shale at depth of 12 to 18 inches.	Poor strength and stability; high shrink-swell potential.

interpretations —Continued

Soil features affecting—Continued						
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Limitations for use as sewage-disposal fields
Reservoir area	Embankment					
Chance of excessive seepage.	Poor strength and stability.	Not needed.	Moderate intake rate; moderate water-holding capacity.	Erodible on steep slopes.	Fragipan; low natural fertility; grows good grass if fertilized.	Moderate; fragipan at depth of about 24 inches.
Chance of excessive seepage.	Fair strength and stability; slopes erodible.	Not needed.	Low intake rate; moderate water-holding capacity.	Erodible on steep slopes.	Fragipan; grows good sod if fertilized.	Moderate; fragipan at depth of about 24 inches.
Local areas have sand strata.	Fair strength and stability.	Not needed.	Moderate intake rate; moderate water-holding capacity.	Erodible on steep slopes.	Low natural fertility; grows good sod if fertilized.	Slight on slopes of less than 10 percent.
Hazardous in substratum.	Poor to fair strength and stability; side slopes erodible.	Not needed	Moderate intake rate; moderate water-holding capacity.	Erodible	Erodible	Moderate to severe.
Slow seepage rate.	Poor strength and stability.	Subsurface drainage needed.	Slow intake rate	High water table; material hard to work.	High water table; Material hard to work.	Very severe; high water table.
Slow seepage; subject to flooding.	Unstable; high water table; high shrink-swell potential.	Subsurface drainage needed.	Moderate intake rate; moderate water-holding capacity.	High water table; material hard to work.	High water table; material hard to work.	Severe; subject to flooding.
Slow seepage; subject to flooding.	Poor strength and stability; high shrink-swell potential.	Limited outlets; slow permeability; high water table.	Slow intake rate; slow permeability; moderate water-holding capacity.	Not needed	Not needed	Very severe; high water table.
Shale at depth of 12 to 18 inches.	Poor strength and stability; slow permeability.	Not needed.	Slow intake rate	High water table; material hard to work.	High water table; material hard to work.	Severe.

TABLE 8.—*Engineering*

[Tests performed by the Mississippi State Highway Department Testing Division in accordance

Soil name and location	Parent material	Mississippi State Highway Laboratory numbers	Depth	Horizon	Moisture-density data[1]	
					Maximum dry density	Optimum moisture
			In.		*Lb. per cu. ft.*	*Pct.*
Atwood silt loam:						
SW¼NW¼ sec. 10, T. 11 S., R. 3 E., experiment station, Pontotoc County, Miss.	Thin loess over Coastal Plain deposits.	402255	11 to 23	B21	105.9	18.7
		402256	37 to 49	IIB23t	106.2	18.0
SW¼NE¼ sec. 17, T. 10 S., R. 3 E., 2¼ miles south of Pontotoc, Miss., Pontotoc County.	Thin loess over Coastal Plain deposits.	402257	18 to 31	B22t	105.3	19.5
		402258	45 to 57	IIB24t	106.4	18.5
Bude silt loam:						
SE¼SW¼ sec. 10, T. 3 S., R. 3 E.	Thin loess over Coastal Plain deposits.	402267	12 to 20	B' and A'2	111.0	16.0
		402268	20 to 24	A'2xg	107.0	17.0
		402269	28 to 46	B'22xgt	109.0	18.0
Falkner silt loam:						
SW¼SW¼ sec. 10, T. 5 S., R. 3 E.	Thin loess over Coastal Plain clays.	402262	12 to 18	B22	100.0	22.0
		402263	41 to 61	IIc3g	96.0	25.0

[1] Based on AASHO Designation: T 99–57, Method A (*1*).

[2] Mechanical analysis according to AASHO Designation. T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser

The information contained in tables 6 and 7 should be helpful in planning, designing, and constructing the drainage facilities described in the following paragraphs.

V-type and W-type ditches.—Ditches of these types intercept runoff from crop rows and discharge it into mains and laterals. As the name implies, the V-type ditch is shaped like the letter V. It has side slopes no steeper than 4:1 and has capacity to remove 3 inches of water in 24 hours. A V-type ditch is easy to maintain, and it can be crossed by farm machinery. The spoil should be completely spread in adjacent low areas, or else inlets must be constructed to permit entrance of row water.

A W-type ditch is built by moving the spoil from two small parallel ditches toward the center of the area between ditches, so that it forms a gently sloping ridge. Water from the rows on both sides can drain easily into the side ditches. The raised center can be cultivated, or it can be used as a road.

Row arrangement.—In nearly level areas, crop rows should be so arranged as to follow a controlled grade. If the right grade is established, surplus water will run off without causing erosion. The right grade will also help to conserve water during seasons of deficient rainfall. Rows should discharge into V-type and W-type surface ditches or tail ditches. Ditches should be close enough together that rows can be short, so that water will not accumulate in an amount too great to flow through the rows.

On steeper slopes that lack terraces, rows are laid parallel to surveyed "key" lines and generally drain from ridges to draws in which vegetated waterways have been established. On medium-textured and coarse-textured soils, the key lines are run on a 0.3 percent grade. On fine-textured, poorly drained soils, the grade is 0.4 percent. Land smoothing in the intervals between the key lines makes better row alinement possible and, consequently, better drainage.

Mains and laterals.—These ditches are trapezoidal in shape and are generally cut with a dragline (fig. 12). They have a minimum depth of 2½ feet and are 3 feet wide. The side slopes vary between 1:1 in fine-textured, plastic material and 3:1 in coarse-textured silts and sands. Ditches of this type frequently serve several farms.

Outlets.—There are numerous large streams that, if improved, would provide outlets for mains and laterals. Improvements are underway on some of these streams; others are in various stages of planning.

Figure 12.—Dragline ditch draining field of Chastain soils.

test data

with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis[2]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than—						AASHO	Unified
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	100	100	94	93	75	41	35	46	24	A-7-6(15)	CL.
100	100	100	83	82	70	41	35	43	20	A-7-6(13)	CL.
100	100	100	88	86	70	42	36	49	32	A-7-6(18)	CL.
100	100	100	84	82	69	44	39	53	36	A-7-6(19)	CH.
100	98	94	85	82	61	30	23	34	13	A-6(9)	CL.
100	98	94	87	82	64	35	28	45	25	A-7-6(15)	CL.
100	98	95	87	84	70	42	36	58	38	A-7-6(20)	CH.
100	99	98	97	96	82	45	39	51	27	A-7-6(17)	CH.
100	99	98	97	94	80	53	46	72	51	A-7-6(20)	CH.

than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

Irrigation.—The average annual rainfall in Tippah County is about 54 inches, but even in normal years supplemental irrigation is needed because, during June, July, and August, there is not enough moisture for optimum growth of plants. Sprinkler irrigation has been used, but only to a limited extent, because of the high initial cost, the cost of operation, and the comparatively low value per acre of crops grown. The border and graded furrow methods have not been used, because severe flooding makes land leveling, which is essential to such methods, impractical. When flooding of the bottom lands is controlled by water-retarding dams (fig. 13) and by channel enlargement and improvement, these methods of irrigation will be economically sound and practical, if other factors are favorable. General suitability of the soils for irrigation is shown in table 7, which begins on page 60.

Ponds. Extensive use has been made of farm ponds for supplying water for livestock, as recreational facilities, and for production of fish. Ponds are established by constructing an embankment, generally not more than 15 feet in height, across a watercourse or natural basin. In impervious material, ponds are established by excavating a pit or dugout. Side slopes for embankments should be 2:1 if the soil material is clayey gravel (GC), clayey sand (SC), or silty sand (SM); 2½:1 if it is sandy or silty clay (CL) or clayey fine sand (ML); and 3:1 if it is plastic clay (CH) or clayey silt (MH).

The topography of the sites selected should permit storage of water to a minimum depth of 6 feet in one fifth of the pond area for embankment-type ponds and in one-fourth of the area for dugout or pit-type ponds.

If runoff from the watershed is the only source of water, there should be at least 5 acres of watershed for each surface acre of pond. If inexpensive vegetated spillways are to be used, the maximum size of the watershed should be such that not more than 100 cubic feet per second of runoff water will pass through the spillway. Generally, this would be approximately 60 acres. If surface runoff is the chief source of water, the soils should be impervious enough to prevent excessive seepage.

Foundations should be of materials that have sufficient bearing strength after minimum compaction to support a dam, and the underlying material should be impervious enough to prevent excess seepage.

Terraces. A terrace consists of an earthen embankment, or ridge, and a channel. Terraces are constructed across the slope at suitable intervals and on suitable grades. They collect runoff and transport it at nonerosive velocities to protected outlets in draws or other suitable locations (fig. 14). Conventional terraces, which follow the contour, have been used extensively for years in Tippah County. Such terraces ordinarily are crooked; they cut a field into numerous areas of irregular shape and thus make impractical the use of mechanized, multiple-row farm equipment. A different kind of terrace system has been developed to accommodate this kind of equipment. By land smoothing, cutting and filling along terrace lines, varying the grade, and using multiple outlets, it is possible to construct a system of parallel terraces that results in significantly fewer irregularly shaped areas.

Figure 13.—Aerial view of Dumas Lake, a flood-retarding structure. Adjoining very steep forested areas are Ruston soils.

The terrace-grade and channel-size relationship must be such that the terraces will have capacity to remove, at nonerosive velocities, the runoff that would follow a rainfall of the intensity that can be expected once in 10 years. For the uppermost 200 feet of terrace, the grade should not exceed 1.5 percent. For the rest of the terrace, the grade may vary but the average should not exceed 0.5 percent. If the soils are fine textured and not readily eroded, a terrace may have a grade of as much as 1 percent for a distance not exceeding 100 feet. Terraces are not effective on deep sands, or on stony, steep, or shallow soils.

Diversions.—A diversion is established by constructing a ridge with a channel on its upper side, across the slope and at a controlled grade. The side slopes of the ridge and channel should be no steeper than 3:1. The capacity of the channel should be adequate to transport to protected waterways, at nonerosive velocities, the runoff that would follow the heaviest rainfall to be expected in a 10-year period. The velocity should not exceed 3 feet per second if the soils are coarse textured (SM, SC, CL, ML) or 4 feet per second if the soils are fine textured (MH, CH, OH).

A diversion ordinarily is located near the foot of a slope, where it intercepts the uncontrolled runoff from higher lying areas and diverts it to areas where the water can be put to beneficial use. Uncontrolled runoff is damaging not only to cropland, pastureland, and farmsteads, but also to terraces and row-arrangement systems.

The general suitability of the soils for conservation engineering practices is shown in table 7, which begins on page 60.

Highway and Foundation Engineering

The chief soil-related problems in highway and foundation engineering result from undesirable physical and chemical properties and poor drainage. Tables 6, 7, and 8 (on pages 54, 60, and 64) contain information about these properties and evaluations of the various soils as construction material.

A high water table is an important consideration in planning and designing engineering works. In this county, Ora, Providence, Hatchie, Tickfaw, Urbo, Bude, Waverly, Falaya, Almo, Freeland, Iuka, Collins, Bibb, Chastain, Dulac, Falkner, and Mantachie soils, and Mixed alluvial land all have a high water table and therefore

need adequate drainage before they can be used as foundations for buildings and roadways. If roadways are planned through these soils, the problems resulting from a high water table can be partially overcome by constructing roadbeds in fill sections.

A fragipan, or a compacted stratum of silt and finer textured material, also impedes movement of water through soil and presents a design problem. Ora, Providence, Hatchie, Freeland, Bude, Almo, and Dulac soils have a fragipan at a depth of 19 to 28 inches.

Shear strength affects the stability of slopes and the bearing capacity of soils for foundation purposes. The shear strength of coarse-grained soils (G and S) is sufficient for most purposes unless excessive neutral stress, water pressure for example, is encountered. Iuka, Ora, and Ruston soils are the best foundation material available in the county for buildings, highways, and airports. The fact that Iuka soils are subject to flooding must be considered if these soils are to be used as sites for buildings, highways, and airports.

Sand and gravel suitable for concrete aggregate are not available in this county. Bedrock presents no problem, because it occurs at a great depth, but for the same reason it cannot be used as footings for foundations.

Almost all of the soils in this county are acid.

The ratings for shrink-swell potential are based on the results of volume-change tests or on the observance of other physical properties or characteristics of the soils. For example, the subsoil of Wilcox soils is very sticky when wet and develops extensive shrinkage cracks when dry; hence, the shrink-swell potential is very high. On the other hand, the subsoil of Ruston soils is plastic to only slightly plastic and has a relatively low shrink-swell potential.

If used for fill, material of high shrink-swell potential should be placed when wet and compacted lightly. Strength requirements and the possibility of settlement need to be considered if such materials are used. Coarse-grained and medium-grained soils are generally least affected by changes in moisture content. A subcourse of such material under the pavement, across the entire roadbed, minimizes the risk of breaking and cracking. The substrata of Ruston, Ora, and Iuka soils are sources of material that can be used satisfactorily for subcourses. The substrata of Urbo, Tickfaw, Wilcox, Shubuta, Chastain, Cuthbert, Dulac, Waverly, and Falkner soils consist of material that has a high shrink-swell potential.

Sanitation Engineering

The following paragraphs describe sewage-disposal systems and discuss the features and characteristics that should be considered in evaluating the suitability of soils for use in such systems. The information given in tables 6 and 7 on chemical and physical properties of the soils and their suitability for various engineering uses should be helpful in planning and designing sewerage systems.

Sewage-Disposal Fields.—The electrification of farms and the rapid expansion of residential areas into rural communities within recent years have resulted in an increased number of septic-tank filter fields for sewage disposal. The absorptive rate of the soil, the groundwater level, and the depth to rock, sand, or gravel, the slope of the ground surface, flooding, and the nearness

Figure 11.—Terrace that diverts runoff from hillside and protects lower lying fields of Falaya silt loam.

to streams or other bodies of water should all be considered in planning and designing this type of sewage-disposal system.

The first consideration should be the absorptive capability of the soils (*16*). The septic-tank effluent must be absorbed and filtered by the soil. This process removes odors, prevents contamination of ground water, and prevents a concentration of unfiltered sewage that may reach the ground surface. Soils that have a percolation rate of 1 inch per hour are suitable for filter fields, if other topographic and geologic factors are favorable. In this county, undisturbed areas of the soils classified as GC, SM, SC, ML, CL, OL, and MH generally meet these requirements. On-site percolation tests should be made, however, because of the possibility of problems resulting from a fragipan or other impervious material. The CH and OH soils are not suitable for filter fields, because they contain a fragipan or other impervious material.

If different soils occur within a short distance, each trench should be placed wholly within one kind of soil so that each kind of soil may absorb and filter the effluent according to its capabilities.

Filter fields in soils that either have a high water table or are periodically flooded do not function satisfactorily. Mantachie, Falaya, Collins, Iuka, Urbo, Waverly, Bibb, and Chastain soils, and Mixed alluvial land are subject to overflow. Hatchie, Bibb, Tickfaw, Urbo, Bude, Waverly, Falaya, Almo, Chastain, Collins, Freeland, Iuka, Ora, Providence, Dulac, Mantachie, and Falkner soils, and Mixed alluvial land have a seasonally high water table.

Slopes of less than 10 percent present no serious problems if the soils are otherwise suitable and trenches are constructed on the countour. On steeper slopes it is more difficult to construct trench filter fields. Also, there is the danger that effluent may reach the surface below the filter fields before it is completely filtered.

Bedrock is at a great depth in Tippah County and presents no problem.

Sewage Lagoons.—Sewage lagoons are being used extensively. Low embankments for the lagoon are usually constructed of homogenous material found at the sites.

For satisfactory performance, losses through evaporation and seepage must not exceed the incoming volume of effluent. The material in the embankment and reservoir must be relatively impervious. Permeability of the embankment, as well as stability, is important. The foundation under the embankment should be considered in planning and design.

The best soils for sewage lagoons in Tippah County are the soils classified as SM and SC. Those classified as ML, MH, CL, and CH, are satisfactory if the soil material is mixed with that in the SM or SC group. Normally, impervious cores are not needed for this type of enbankment in Tippah County.

The best sites for unlined reservoirs[5] are formations composed of the soils classified as SC, CL, or CH. These soils are nearly impervious and do not allow excess seepage. They are generally satisfactory either in uniform deposits or in combination. Silty soils classified as MH, ML, or SM are less desirable than more nearly impervious soils for use as bottoms for ponds and reservoirs, but they may function satisfactorily if they occur with layers of less permeable soils.

Use of Soils for Wildlife and Fish

All of the soils of Tippah County are suited to one or more species of wildlife. The type of vegetation and the land use determine the species of wildlife and the wildlife population of an area. The quality and management of water resources determine the kinds and numbers of fish.

Habitat Requirements

Woodland provides a suitable habitat for some species of wildlife, open farmland for some, and wetland for others. Most species need a mixture of food and cover plants, plus water.

GAME SPECIES.—Bobwhites, doves, and rabbits are attracted to areas of open agricultural land. They are more commonly associated with row-crop farming than with livestock farming. Forest game—squirrels, deer, and turkeys—thrive best in woodland where part of the stand is hardwoods. The Holly Springs National Forest in the western part of the county is a good example of this type of woodland. Ducks are of minor importance, but a few are to be found along the larger streams and in beaver ponds on the smaller streams.

Bobwhites.—These birds need open and semiopen land. They need food near sheltering vegetation that protects them from predators and adverse weather. Such habitat exists mainly in areas of row-crop farming. Choice foods for bobwhites are acorns, beechnuts, blackberries, black cherries, mulberries, corn, soybeans, partridgepeas, cowpeas, ragweed, tickclover or beggarticks, browntop millet, bicolor lespedeza, Kobe lespedeza, Korean lespedeza, common lespedeza, flowering dogwood, and the seeds of pine and sweetgum trees. Bobwhites also eat insects in the warm seasons.

Deer.—Woodland areas of 500 acres or more and water for drinking are necessary for deer. Deer eat a wide variety of plant foods. Some of their choice foods are acorns, clovers, corn, cowpeas, greenbriers, honeysuckle, oats, rescuegrass, and wheat. They also eat many other native forage plants.

Doves.—Some of the choice foods of these birds are corn, grain sorghum, wheat, pokeberry, ragweed, sunflower, browntop millet, several species of panicgrass, croton seeds, and the seeds of pine and sweetgum trees. For feeding, doves prefer open fields without thick ground cover. They require water daily.

Ducks.—Areas of natural water or areas that are flooded in winter are necessary for ducks. Some of their choice foods are acorns, beechnuts, browntop millet, corn, Japanese millet, and smartweed.

Rabbits.—Adequate cover is the primary need for rabbits. Good cover plants are blackberry briers, multiflora rose, sericea lespedeza, and any low-growing brush, shrubs, and annual weeds. Rabbits feed chiefly on grasses, clovers, grains, and bark.

Squirrels.—Woodland that includes hardwoods and covers at least a few acres is necessary for squirrels. Choice foods are acorns, beechnuts, hickory nuts, pecans, corn, black cherries, mulberries, dogwood, and the seeds of blackgum, maple, and pine trees.

NONGAME BIRDS.—Many species of birds live in all types of habitats. Their food and other requirements vary. Some eat nothing but insects. A few eat insects and fruits. Several others eat insects, acorns, nuts, and fruits.

FISH.—Bass, bluegill and other sunfish, and channel catfish are the principal game fish in the ponds and streams of the county. Bluegills and most of the sunfish eat aquatic worms, insects, and insect larvae. Bass and catfish eat small fish, frogs, crayfish, and other aquatic forms of life. The amount of fish food and the poundage of usable fish produced in ponds depends on the fertility of the watershed and of the pond bottom. Most ponds need fertilizer and lime to produce plenty of food for fish.

Wildlife Groups

The suitability groups of soils for plants that furnish food and cover for wildlife are discussed in the following paragraphs, and management suggestions are given. Each of the groups consists of one or more soil associations (see colored general soil map at the back of this report). All of the soils in a given group are similar in their ability to support the food and habitat necessary for various species of wildlife.

Group 1

This group consists of the Wilcox-Dulac-Falkner association, which is in the Interior Flatwoods section. The soils are silty or clayey and somewhat poorly drained or moderately well drained. The area is one of wide, flat ridges, short side slopes, and narrow stream bottoms. A large part of it was once cleared and row cropped. The steeper slopes are now reverting to trees. There are numerous areas of cutover scrub hardwood. The number of dairy farms is increasing.

This area is typically one of small farms, which provide conditions suitable for bobwhite quail and rabbits. Many of the native quail-food plants, particularly lespedeza, grow well in this area, and so do cultivated plants, cowpeas, soybeans, bicolor lespedeza, and browntop millet, all of which provide food for quail. Natural cover for

[5] Unlined sewage lagoons.

quail and rabbits is abundant. Favoring the native food and cover plants and planting choice foods where needed will maintain or increase the number of quail and rabbits. Cover plants would make suitable habitats for rabbits in pastures, but pastureland is not a suitable habitat for bob white quail.

Doves feed on waste grain and on the seeds of weeds and grasses in cornfields and grain sorghum fields. They are also attracted to fields of browntop millet.

The wooded areas support moderate populations of squirrels. The number of squirrels will increase if hardwoods, which are necessary for these animals, are favored in management.

Sites suitable for feeding areas for ducks are limited, but there are a few along some of the wider stream bottoms. Most of the soils hold water and can be flooded in winter for duck fields. Browntop millet and Japanese millet can be grown.

The soils and the topography are suitable for lakes and ponds. Large numbers of fish and good rates of growth are possible if ponds are kept fertile.

Group II

This group consists of the Mantachie-Bibb association and the Falaya Urbo Waverly association. These are areas of rather wide, flat stream bottoms and gently sloping terraces along the Hatchie River, Tippah Creek, Muddy Creek, and Dry Run. A large part of the acreage has been cleared and is row cropped or pastured. Much of the poorly drained part is reverting to trees.

These areas are less well suited to bobwhite quail than are other parts of the county. Those accessible to quail are farmed intensively and therefore lack an abundant supply of native food plants. Their value as a habitat will increase if space is left for native food and cover plants, and if cultivated food plants are grown.

Protective cover, which is limited in these associations, is essential for rabbits. Good habitat can be provided by letting native briers, weeds, and brush grow along field edges and borders and along ditchbanks.

Mourning doves do well in these areas. The open fields of corn, grain sorghum, and soybeans furnish most of their food. The soils are highly productive of browntop millet, which also provides choice food for these birds.

Forest game is scarce here because most of the land is open. Squirrels inhabit the small wooded areas where there are enough mature hardwoods to furnish their food.

For the most part, the topography is not well suited to fish ponds. Most ponds are necessarily the dug or levee type. The soils, however, do hold water, and if suitable sites can be found, ponds will produce plenty of food for fish.

There are many sites where duck-feeding fields can be constructed. The flat stream bottoms are well suited to such purposes, and the soils are productive of browntop millet and Japanese millet.

Group III

This group consists of the Ruston-Cuthbert-Ora association and the Ruston-Cuthbert-Providence association, both of which are made up of well-drained sandy and clayey soils of the Coastal Plain. These are areas of steep and very steep ridges and very narrow stream bottoms. Much of the acreage has been damaged by gully erosion. Most of the slopes have never been cleared of timber, and almost all of the open agricultural land is on the narrow stream bottoms and the lower slopes.

These areas are generally better suited to forest game than to farm game species. Deer and squirrels inhabit the woodlands. Hardwoods are common, particularly in the stream bottoms. A management program that favors the mature hardwoods in the stand is necessary for squirrels. Even where pine is being established, enough hardwoods should be left to maintain a good habitat for forest game.

The only habitats for farm game species are in the scattered tracts of open land. Farmland provides suitable conditions for quail and rabbits. Wild lespedeza grows abundantly around fields and in some of the pastureland. Other native quail-food plants also grow well, and so do the cultivated plants that provide food for quail.

Doves are less plentiful here than in other parts of the county. For feeding, they prefer open fields without thick cover. Planting choice foods will increase the number of doves.

Ducks are scarce. A few stop temporarily in the farm ponds. Sites suitable for constructing duck-feeding fields are almost nonexistent.

The soils and topography are suitable for the construction of lakes and ponds. Unfertilized ponds normally produce food for 75 to 125 pounds of fish per acre yearly. The well-fertilized ponds produce enough food for 300 to 400 pounds of fish per acre yearly.

Formation and Classification of Soils

The purpose of this section is to present the main morphological characteristics of the soils of Tippah County and to show their relationship to the five factors of soil formation. Also in this section, the soils of the county are classified by higher categories according to the system of soil classification now in use in the United States.

Factors of Soil Formation

Soil is a function of parent material, climate, living organisms, topography, and time. The nature of the soil at any point on the earth depends upon the combination of the five major factors at that point. All five of these factors come into play in the genesis of every soil. The relative importance of each differs from place to place. In extreme cases, one factor may dominate in the formation of the soil and fix most of its properties, as is common when the parent material consists of pure quartz sand. Little can happen to quartz sand, and soils derived from it usually have faint horizons. Even in quartz sand, however, distinct profiles can be formed under certain types of vegetation where the topography is low and flat and the water table is high.

The five soil-forming factors are interdependent; each modifies the effects of the others. Climate and vegetation are the active factors that change the parent material into soil. Relief largely controls runoff and therefore influences the effectiveness of climate and vegetation.

In Tippah County, differences in kind of parent material and in topography account for the principal difference among the soils.

On the following pages is a discussion of each of the five major factors of soil formation and of the effects of each on the soils of the county.

Parent material

The Gulf of Mexico covered the Mississippi River Valley as far northward as Cairo, Ill., during the late Mesozoic and early Cenozoic eras of geologic time. It covered the entire State of Mississippi, except for small areas in Tishomingo County.

Streams emptying into the Gulf deposited layers of unconsolidated sand, clay, and silt. The shells of dead sea animals and calcareous precipitates furnished most of the material now found in the layers of limestone and marl.

After the Gulf receded from what is now Tippah County and the marine deposits were exposed, layers of windblown silt, commonly called "loess," were deposited. In this county these layers seldom exceed 4 feet in thickness. Where the slope is more than 12 percent, loess is almost entirely lacking. In the eastern part of the county, especially in the area east of the Hatchie River, this silty loess is mixed with sandy Coastal Plain material, and sandy, coarse-textured soils predominate in that area. In the western two-thirds of the county, a layer of loess is to be found in most of the stream bottoms and on most ridges and terraces.

Climate

Tippah County has the humid, temperate climate characteristic of the southeastern United States. A description of the climate is given in the section "Additional Facts About the County." Also in that section are statistics on temperature and precipitation.

There is little or no variation in climate within the county. Consequently, the effect of climate on soil development has been uniform. Even though climate has strongly affected the formation of many of the soils, differences among soils within the county cannot be attributed to differences in climate.

Many soils that developed in a humid, temperate climate have distinct characteristics. This is true in Tippah County, where many of the soils are strongly weathered, highly leached, acid, and low in natural fertility. The high rainfall causes rather intense leaching and also causes the soluble and colloidal material to move downward through the soil. The soil is frozen only for short periods in winter, and translocation and leaching proceed without interruption throughout most of the year.

Living organisms

The kinds and numbers of higher plants and of earthworms, micro-organisms, insects, and other organisms that live on or in the soil and affect its development depend on climate, water supply, and many other factors.

The organic matter that accumulates on the surface and in the upper part of the soil is supplied by leaves, twigs, stems, and roots. These are attacked by other living organisms and converted to different chemical products. Over a period of time, the organic acids released during the decomposition of organic matter and the atmospheric acids absorbed by rainfall dissolve the slowly soluble mineral constituents in the soil and speed the leaching and translocation of inorganic materials.

Early settlers found dense stands of mixed hardwoods and an understory of vines and native shrubs on the lower hillsides. The well-drained ridges and upper side slopes were covered with hardwood and pine trees. In the stream bottoms the native vegetation ranged from thick stands of large deciduous trees and a heavy understory of vines and cane to fresh-water swamp vegetation of cypress and tupelo-gum and very little undergrowth.

In some of the soils, aerobic conditions support vigorous biological activity. In other soils, anaerobic conditions result in very slow decomposition of organic matters. On the better drained uplands and terraces, aerobic soil conditions favor a rapid decomposition of organic matter, and the layer of partially decomposed forest litter is seldom more than 1 inch to 1½ inches thick.

A vast number of organisms live in the soils of the county. Most of these organisms are plants, but there are also small animals, including spring-tails, millipedes, sowbugs, mites, earthworms, nematodes, protozoa, rotifers, and many others. The plants include algae, fungi, actinomycetes, bacteria, the roots of higher plants, and others.

The existence of these organisms depends on soil conditions, and particularly on the food supply. Their number fluctuates constantly, but the surface layer probably contains more than 5 tons of living and dead organisms per acre.

The most intensive activity of earthworms and other organisms is within the uppermost few inches of the soil. Mixing of the soil by rodents does not seem to be of much significance in this county. In wet flats and wet bottoms, particularly in pastures and other open areas, there is an enormous amount of soil mixing by crawfish. The uprooting of trees by wind also causes an enormous amount of soil mixing.

When the forests are cleared and the soils cultivated, and when wet areas are drained, the complex of living organisms in the soil changes drastically. Such changes alter the soil environment and the soil-forming processes and affect the future development of the soils.

Topography

The topography of Tippah County is varied. The slope ranges from nearly level to very steep. The maximum difference in elevation between the valleys and the adjacent hill crests is about 260 feet.

Loess deposited on steep and very steep slopes was removed by geologic erosion almost as fast as it was deposited. Thin deposits of loess remain on nearly flat ridgetops, on terraces, and in the stream bottoms throughout the western two-thirds of the county.

Because there is no water table on the steep and very steep side slopes, the subsoil is well aerated and is yellowish red in color. Some of the soils derived from thick beds of shale have a shallow root zone because of their steep slopes. On these steep slopes, geologic erosion has almost kept pace with soil formation. In level areas and depressions, where the water table is high, the soils are likely to be gray and wet. A fragipan, or a compacted stratum of silt and finer textured material, is likely to form in many of the soils in nearly level areas. As the slope increases, the thickness of the fragipan usually decreases. Pans seldom form where the slope is more than 12 percent.

Time

Differences in the length of time of soil formation are responsible for most differences among soils that cannot be traced back to parent material or relief. The soils of the stream bottoms are the youngest; they lack distinctly developed profile characteristics. Geologic erosion and accelerated erosion are continuous on the uplands, and the stream bottoms receive deposits of fresh sediments frequently.

The soils of the stream terraces are older than the soils of the stream bottoms but younger than those of the uplands.

The soils of the uplands are the oldest in the county. They furnished the parent material from which the terrace soils formed. The soils of the side slopes, formed in thick beds of sandy loam—Ruston soils for example—are the oldest of the upland soils. The soils of the ridges and upper side slopes in the western two-thirds of the county, where loess deposits are about 2 feet thick, are about the same age as the soils of the stream terraces.

Soil-Forming Processes

The soil-forming processes are complex and dynamic. They have drastically changed the part of the earth that Tippah County represents. With great energy they began a process of change on the surface of the county when it emerged from beneath the Gulf of Mexico millions of years ago, and they have produced the soils of the county as we now know them. These soil-forming processes are still very active. Ruston and Ora soils are more nearly in equilibrium than other soils of the county, all of which are younger.

The differences among the horizons of the soils of the county are caused by one or more of the following processes: (1) accumulation of organic matter; (2) leaching of carbonates and salts; (3) translocation of silicate clay minerals; or (4) reduction and transfer of iron.

Organic matter has accumulated in the top layer of all of the soils of the county to form an A horizon. Much of this organic matter is in the form of humus, although a considerable amount is in the form of living plants and organisms.

The carbonates and salts have been leached from all of the soils of the county. This process is of limited significance in the differentiation of soil horizons, for it has affected nearly all horizons, each of them with comparable intensity. The carbonates and salts have been completely removed, and most of the soils of the county are strongly acid to very strongly acid; the colloidal complexes are predominantly saturated with hydrogen ions.

Translocation of the silicate clay minerals has affected all of the soils in the county except the alluvial, or bottomland, soils. Because alluvial soils are relatively young, the processes that cause the translocation of silicate clay minerals have not acted on them for a sufficient length of time to cause significant differences among the layers. In the older soils the A horizons are eluviated and have a low content of clay. The illuvial B horizons show an accumulation of clay, particularly in the upper part. Results of this downward movement of clay are visible in the form of clay films on ped surfaces and on the walls of root and worm or insect holes. Several of the soils of the county have more than one sequum, that is, more than one eluvial horizon and its related illuvial horizon.

Reduction and transfer of iron has occurred in the poorly drained and somewhat poorly drained soils. It also has occurred to some extent in the lower part of the moderately well drained soils. This process of reduction and transfer of iron is sometimes called gleization. It is influenced by topography and is most common in level areas and depressions, where the water table is above or near the surface during much of the wet season. Lack of water movement through the profiles of these soils causes reduced leaching, anaerobic biological activity, accumulation of organic acids, reduction of iron, development of gray colors, and accumulation of organic matter. The iron is segregated in some of the horizons in the form of yellowish-brown, brown, and yellowish-red mottles and brownish-black concretions.

Classification of Soils

For a successful study of any heterogeneous group in nature, a classification based on the natural qualities or properties of the individuals that make up the group is needed. Such a classification is essential in the study of soils.

Soils are placed in narrow classes for organization and application of knowledge about their behavior within farms or counties. Soils are placed in broad classes for study and comparison of great areas, such as subcontinents and continents. The system of soil classification currently being used in the United States and elsewhere has six categories. Beginning with the broadest category and proceeding toward the narrow, they are the order, the suborder, the great soil group, the family, the series, and the type. There are only three orders, into which the soils of the whole country can be classified, but there are thousands of soil types. The development of suborders and families is incomplete; consequently, these categories are little used.

Table 9 shows the four great soil groups represented in Tippah County. Table 10 shows characteristics and genetic relationships of the soil series.

In the pages that follow are descriptions of the great soil groups in which the soils of the county have been classified and a detailed description of a representative profile of each soil series.

TABLE 9.—*Soil classification in the higher categories*

[Adapted from Thorp and Smith (*14*)]

Order	Suborder	Great soil group
Zonal soils	Light-colored podzolized soils of the timbered regions.	Red-Yellow Podzolic soils. Gray-Brown Podzolic soils.
Intrazonal soils	Hydromorphic soils of marshes, swamps, seep areas, and flats.	Low-Humic Gley soils. Planosols.
Azonal soils	([1])	Alluvial soils.

[1] The azonal order is not divided into suborders.

TABLE 10.—*Characteristics and genetic relationships of soil series*

Parent material	Great soil groups and drainage class							
	Red-Yellow Podzolic soils			Gray-Brown Podzolic soils	Low-Humic Gley soils	Planosols		Alluvial soils
	Well drained	Moderately well drained	Somewhat poorly drained	Moderately well drained	Poorly drained	Somewhat poorly drained	Poorly drained	Moderately well drained
Predominantly coarse-textured, acid Coastal Plain sediments consisting of light silt loam, sandy loam, loam, and sandy clay loam. (Approximately 55 percent of the county.)	Ruston.	Ora.[1]			Bibb. Mantachie.			Iuka.
Predominantly medium-textured, thin loess overlying acid Coastal Plain sediments consisting of silt loam, silty clay loam, friable clay loam, silty clay, and clay. (Approximately 25 percent of the county.)	Atwood (intergrades toward Reddish-Brown Lateritic).	Dulac.[1] Freeland.[1]	Falkner (intergrades toward Low-Humic Gley).	Providence.[1]	Waverly. Falaya.	Bude.[1] Hatchie.[1]	Almo.[1] Tickfaw.	Collins.
Predominantly fine-textured, acid Coastal Plain sediments consisting of silty clay loam, heavy clay loam, sandy clay, and clay. (Approximately 20 percent of the county.)	Shubuta.	Cuthbert.	Wilcox (intergrades toward Grumusol)		Chastain. Urbo.			

[1] Contains fragipan.

Zonal order

The zonal order is made up of soils that have evident, genetically related horizons. These soils reflect the influence of the active factors of soil genesis—climate and living organisms, chiefly vegetation. The zonal order is represented in this county by the Red-Yellow Podzolic and the Gray-Brown Podzolic great soil groups.

RED-YELLOW PODZOLIC SOILS

This great soil group consists of well-developed, well-drained, acid soils that have a thin organic (O2) horizon and an organic-mineral (A1) horizon over a light-colored bleached (A2) horizon. Parent materials are all more or less siliceous. Coarse reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic of deep horizons of Red-Yellow Podzolic soils where parent materials are thick (*14*). The soils of this group generally have a low cation-exchange capacity and a low percentage of base saturation. The subsoil has moderate, subangular blocky structure and moderate to high chroma.

The Red-Yellow Podzolic soils are well represented in Tippah County. The Ruston soils, members of the Red-Yellow Podzolic great soil group, are the most extensive soils in the county.

Although the investigations that have been made into the genesis of Red-Yellow Podzolic soils are relatively few as compared with those of most other great soil groups, a good many theories have been brought forth. One of the more recent is based on the processes of eluviation and illuviation and has evolved mainly from studies of Gray-Brown Podzolic soils and Brunizems (Prairie soils). This theory places major importance upon the translocation of silicate minerals within the profile. It is presumed that most of the clay in the B horizon has moved down from the A horizon.

This theory gives a far less satisfactory explanation for the genesis of Red Yellow Podzolic soils than for Gray Brown Podzolic soils. The Red-Yellow Podzolic soils have an A horizon that has a low clay content, is comparatively thin, and forms a small part of the entire profile. The lower lying zone of greater clay concentration is comparatively thick. The total amount of clay in the B horizon is much larger than the amount that can be attributed to eluviation from the A horizon, plus the clay that was initially present. Therefore, it seems logical that other processes have influenced horizon differentiation. It is therefore suggested that the dominant processes of the genesis of Red Yellow Podzolic soils are the formation of silicate clay minerals in the deeper horizons and the destruction of these minerals in the upper horizons (*13*).

Members of the Red-Yellow Podzolic great soil group in this county are soils of the Cuthbert, Dulac, Freeland, Ora, Ruston, and Shubuta series. Also included in this group are Atwood soils, which intergrade toward the Reddish-Brown Lateritic group; Falkner soils, which intergrade toward the Low Humic Gley group; and Wilcox soils, which intergrade toward the Grumusol group.

CUTHBERT SERIES. The soils of the Cuthbert series are acid and moderately well drained. They are on broad side slopes throughout the county. The slope is more than 12 percent. These soils developed from beds of stratified clay and sandy clay of the Coastal Plain. They represent about 5 percent of the total acreage of the county.

Cuthbert soils are in the same area as Ruston, Shubuta, Wilcox, Providence, Dulac, and Ora soils and are similar to these soils. They have a thinner B horizon and are more poorly drained than Ruston and Shubuta soils. They differ from Wilcox soils in that they are better drained and developed from stratified beds of fine-textured material. They differ from Providence, Dulac, and Ora soils in lacking a fragipan.

Cuthbert soils are low in natural fertility, low in organic-matter content, and low in available water capacity. They have a moderately deep root zone. Most of the acreage is now used for growing trees, but a considerable area has been cleared and is used for grazing. Cuthbert soils are well suited to trees and are important to local agriculture.

The following representative profile of Cuthbert fine sandy loam is located in a wooded area about 1 mile east of the Dry Creek community club building, SE¼NE¼ sec. 23, T. 5 S., R. 5 E.

A1—0 to 3 inches, dark-gray (10YR 4/1, moist) fine sandy loam; weak, fine, granular structure and weak, medium, granular structure; very friable; common fine roots and many medium roots; common, flat, coarse fragments of ferruginous sandstone; few fine mica flakes; strongly acid; abrupt, smooth boundary.

A2—3 to 6 inches, yellowish brown (10YR 5/6, moist) fine sandy loam; weak, fine, granular structure and weak, medium, granular structure; very friable; few fine roots; common, flat, coarse fragments of ferruginous sandstone; few fine mica flakes; extremely acid; abrupt, smooth boundary.

B2t—6 to 16 inches, yellowish-red (5YR 5/6) clay; strong, fine and medium, angular blocky structure; firm; sticky; plastic; few fine roots; thin, patchy clay films on ped surfaces; few fine mica flakes; very strongly acid; clear, smooth boundary.

B3t—16 to 25 inches, strong-brown (7.5YR 5/6) clay; common, fine, faint mottles of yellowish brown (10YR 5/6) and pale brown (10YR 6/3); strong, fine and medium, angular blocky structure; firm; sticky; plastic; few fine roots; few fine mica flakes; very strongly acid; clear, smooth boundary.

C1—25 to 44 inches, mottled strong-brown (7.5YR 5/8), light olive gray (5Y 6/2), and yellowish-red (5YR 5/6) sandy clay; strong, medium, angular blocky structure and strong, coarse, angular blocky structure; friable to firm; sticky; plastic; few fine roots; few fine mica flakes; very strongly acid; clear, smooth boundary.

C2—44 to 58 inches +, mottled olive gray (5Y 5/2), yellowish-brown (10YR 5/8), and red (2.5YR 5/8) sandy clay; strong, medium and coarse, angular blocky structure; friable to firm; sticky; plastic; few fine roots; few fine mica flakes; very strongly acid.

The A horizon is 4 to 7 inches thick. The color ranges from brown to dark gray, and the texture from loamy fine sand to fine sandy loam. In the upper part of the B horizon, the color ranges from yellowish brown to yellowish red, and the texture from clay loam to clay. The lower part of the B horizon may consist of thick beds of sandy clay or alternating thin layers of Coastal Plain material of different textures and colors. In many areas ironstone fragments are common both on the surface and in the profile. The C horizon may contain thin layers of ironstone in places.

DULAC SERIES.—The soils of the Dulac series are acid, are moderately well drained, and have a compact, brittle fragipan. They are on narrow to broad ridgetops and upper side slopes in an area known as "Interior Flatwoods," a belt about 4 miles wide extending from Union County on the south into Tennessee on the north. The slope is less than 12 percent. These soils developed from thin loess and plastic Coastal Plain material. They represent about 4 percent of the total acreage of the county.

Dulac soils are in the same area as Cuthbert, Wilcox, Falkner, Providence, and Bude soils and are similar to these soils. They differ from Cuthbert, Wilcox, and Falkner soils in having a fragipan. Their fragipan is heavier and less sandy than that in Providence soils. They are better drained than Bude soils.

Dulac soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a moderately deep root zone. For the most part, they have been cleared of trees and are now in row crops and in pasture. Dulac soils are generally well suited to crops and are important to local agriculture.

The following representative profile of Dulac silt loam is located in a cultivated field about 2½ miles east of Blue Mountain and about 70 yards east of the Frank Gibson Lake, NW¼SW¼ sec. 10, T. 5 S., R. 3 E.

Ap—0 to 5 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21—5 to 11 inches, brown or dark-brown (7.5YR 4/4) heavy silt loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; very strongly acid; clear, smooth boundary.

B22t—11 to 23 inches, brown or dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable; common, fine, black stains in lower part of horizon; few, thin, patchy clay films; few fine roots; very strongly acid; clear, smooth boundary.

B31x—23 to 33 inches, brown or dark-brown (7.5YR 4/4) silt loam; common, fine, distinct mottles of pale brown (10YR 6/3) and yellowish brown (10YR 5/6); few gray silt coatings; moderate, fine and medium, subangular blocky structure; friable; compact and brittle; few fine roots; common fine voids; common, fine and medium, black coatings and concretions in lower part of horizon; brown (10YR 5/3) flat polygons extending to horizon below; very strongly acid; irregular boundary.

B32tx—33 to 38 inches, mottled yellowish-red (5YR 4/6), dark-red (2.5YR 3/6), light brownish-gray (10YR 6/2), and yellowish-brown (10YR 5/4) heavy silt loam; moderate, fine and medium, subangular blocky structure; firm; compact and brittle; gray silt coatings on peds and in cracks; few fine roots; clay films on all peds; few fine voids; clear, wavy boundary.

IIBb—38 to 60 inches +, dark-red (2.5YR 3/6) clay; common, medium, distinct mottles of light brownish gray (10YR 6/2); strong, medium and coarse, angular blocky structure; very plastic; very sticky; common slickensides; few fine roots; strongly acid.

The Ap horizon is 4 to 8 inches thick and is brown or dark brown. The B horizon is 15 to 20 inches thick and is yellowish red to strong brown. The fragipan is 8 to 20 inches thick and is at a depth of 19 to 30 inches. The matrix color of the fragipan is reddish brown or yellowish red to yellowish brown, and the mottles are yellowish brown and gray. The texture ranges from silt loam to

silty clay loam. The clayey horizon just below the fragipan is at a depth of 24 to 48 inches. It is commonly mottled but may have a matrix color of dark red to yellowish brown. The texture ranges from sandy clay to clay.

FREELAND SERIES.—The soils of the Freeland series are acid, are moderately well drained, and have a weakly compact, brittle fragipan. They are on narrow to broad terraces near most of the large stream bottoms. The slope is less than 5 percent. These soils developed from mixed sandy and silty alluvium washed from upland soils that developed from loess and sandy Coastal Plain material. They represent about one-tenth of 1 percent of the county.

Freeland soils are in the same area as Ruston, Providence, Dulac, Hatchie, Bude, Wilcox, and Cuthbert soils and are similar to these soils. They are siltier in the upper part of the profile than Ruston, Cuthbert, and Wilcox soils. As compared with Hatchie and Bude soils, they are better drained, less mottled, and redder in the subsoil. They are sandier in the upper part of the profile than Dulac and Providence soils.

Freeland soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a moderately deep root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture.

The following representative profile of Freeland silt loam is located in a field 10 miles east of Ripley on State Highway No. 4, and about 1,000 feet southeast of the highway bridge across the Hatchie River, NW¼SW¼ sec. 22, T. 4 S., R. 5 E.

Ap—0 to 7 inches, dark-brown (7.5YR 3/2) silt loam; weak, fine, granular structure; very friable; common fine roots; medium acid; abrupt, smooth boundary.

B1—7 to 12 inches, brown (7.5YR 4/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, smooth boundary.

B21t—12 to 20 inches, brown (7.5YR 4/4) silty clay loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; very strongly acid; gradual, smooth boundary.

B22t—20 to 27 inches, brown or dark-brown (10YR 4/3) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; extremely acid; clear, smooth boundary.

IIB3x—27 to 40 inches, mottled brown (7.5YR 4/2) and light brownish-gray (10YR 6/2) silt loam; mottles are common, medium, and distinct; strong, medium and coarse, subangular blocky structure; firm; weakly compact and brittle; few fine roots in upper 6 inches; common, fine and medium stains of ferromanganese; few, fine, empty root channels or worm channels; very strongly acid; gradual, smooth boundary.

IIC—40 to 56 inches +, mottled strong-brown (7.5YR 5/6) and light gray (10YR 6/1) loam; mottles are many, coarse, and distinct; massive; firm; vertical tongues of light-gray loamy sand; common, fine stains of ferromanganese; few, fine, empty root channels or worm channels; extremely acid.

The A horizon is 5 to 9 inches thick and is pale brown to dark brown. The texture is loam or silt loam. The B horizon is 22 to 35 inches thick. The color ranges from yellowish red to yellowish brown, and the texture from silty clay loam to loam. The fragipan is 10 to 20 inches thick. The base color of the fragipan is reddish brown to yellowish brown, and the mottles are yellowish brown to gray. The texture ranges from sandy loam to silt loam. The C horizon is at a depth of 28 to 45 inches. It is commonly brown mottled with shades of gray. In texture it ranges from light clay loam to sandy loam.

ORA SERIES.—The soils of the Ora series are acid, are moderately well drained or well drained, and have a compact, brittle fragipan. They are on narrow to broad ridgetops and upper side slopes in the eastern one-third of the county. The slope is less than 12 percent. These soils developed from friable, red Coastal Plain material. They represent less than 3 percent of the total acreage of the county.

Ora soils are in the same area as Atwood, Ruston, Providence, Shubuta, and Cuthbert soils and are similar to these soils. They differ from Atwood, Ruston, Shubuta, and Cuthbert soils in having a brittle, compact fragipan. They are sandier in the upper part of the profile than Providence soils.

Ora soils are low in natural fertility, low in organic matter content, and moderate in available water capacity. They have a moderately deep root zone. For the most part, they have been cleared of trees and are now in row crops and in pasture. Ora soils are well suited to crops and are important to local agriculture.

The following representative profile of Ora silt loam is located in a cultivated field 3 miles east of Pine Grove. The site is 2 miles east of the concrete highway bridge across the Hatchie River, along a paved county highway, and about 100 feet north of this roadway, SE¼SW¼ sec. 2, T. 5 S., R. 5 E.

Ap—0 to 6 inches, dark-brown (10YR 4/3, moist) silt loam; weak, medium, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21t—6 to 20 inches, yellowish-red (5YR 4/6, moist) heavy loam; moderate, medium and fine, subangular blocky structure and moderate, medium and fine, angular blocky structure; friable; few fine roots; very strongly acid; gradual, smooth boundary.

B22t—20 to 25 inches, yellowish-red (5YR 4/6, moist) heavy loam; moderate, medium and fine, subangular blocky structure; friable; few fine roots; very strongly acid; gradual, smooth boundary.

B31—25 to 28 inches, mottled yellowish-red (5YR 4/6, moist) and reddish yellow (7.5YR 6/6, moist) loam; mottles are common, medium, and distinct; moderate, fine and medium, subangular blocky structure; friable; few fine roots; very strongly acid; gradual, smooth boundary.

B32x—28 to 52 inches, mottled strong-brown (7.5YR 5/6, moist) and pale-brown (10YR 6/3, moist) sandy loam; mottles are common, medium, and distinct; massive; compact and brittle; firm in place, fragments are friable; this horizon contains vertical, flat, polygonal cracks of pale brown (10YR 6/3, moist) sandy loam; few medium fragments of ferruginous sandstone in lower part; very strongly acid; clear, smooth boundary.

C—52 to 60 inches +, mottled reddish-brown (2.5YR 5/4, moist) and pale-brown (10YR 6/3, moist) sandy clay loam; mottles are common, medium, and prominent; moderate, fine and medium, subangular blocky structure; friable; this horizon has vertical, flat, polygonal cracks filled with pale-brown (10YR 6/3, moist) sandy loam; very strongly acid.

The A horizon is 4 to 8 inches thick and is pale brown to dark brown. The texture is silt loam or loam. The B horizon is 25 to 50 inches thick. In the upper part the color ranges from yellowish red to strong brown or yellowish brown. The fragipan is 10 to 20 inches thick

and is at a depth of 20 to 32 inches. The base color of the fragipan is reddish brown or yellowish red to yellowish brown, and the mottles are yellowish brown to gray. The texture ranges from loam to sandy loam. The C horizon is at a depth of 30 to 60 inches. The color ranges from dark red to yellowish brown, and the texture from clay loam to sandy loam.

RUSTON SERIES.—The soils of the Ruston series are acid and well drained. They are on broad, steep and very steep side slopes throughout the county. The slope is as much as 45 percent. These soils developed from friable, red Coastal Plain material. They represent more than 20 percent of the total acreage of the county.

Ruston soils are in the same area as Cuthbert, Shubuta, Wilcox, Atwood, Providence, Dulac, and Ora soils and are similar to these soils. They are coarser textured in the lower part of the profile than Cuthbert, Shubuta, and Wilcox soils. They are sandier in the upper part of the profile than Atwood, Providence, and Dulac soils. They differ from Ora soils in lacking a fragipan.

Ruston soils are low in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a deep root zone. Most of the acreage is still wooded, although many areas, generally small ones, have been cleared and are now in row crops or in pasture. Ruston soils are suited to pasture where the topography is not so steep that it is impossible to mow and to spread fertilizer with machinery. They are well suited to pine trees and are important to local agriculture.

The following representative profile of Ruston loamy sand is located about 9 miles east of Ripley on State Highway No. 4, and one-half mile southeast on a local road that crosses Clear Creek. The site is about 1,000 feet west of a Tennessee Gas Transmission line and about 100 feet north of the roadway, SW¼SW¼ sec. 29, T. 4 S., R. 5 E.

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, granular structure; very friable; few coarse roots and common fine roots; many fine, medium, and coarse fragments of sandstone; medium acid; clear, smooth boundary.

A2—3 to 11 inches, dark-brown (7.5YR 4/4) loamy sand; weak, fine, granular structure; very friable; few coarse roots and common fine roots; many fine, medium, and coarse fragments of sandstone; strongly acid; clear, smooth boundary.

B1—11 to 16 inches, yellowish-red (5YR 5/6) loamy sand; weak, fine and medium, subangular blocky structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B2t—16 to 23 inches, red (2.5YR 4/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, smooth boundary.

B3t—23 to 44 inches, red (2.5YR 4/6) fine sandy clay loam; weak, fine and medium, subangular blocky structure; very friable; strongly acid; clear, smooth boundary.

C—44 to 72 inches +, red (2.5YR 4/8) sandy loam; single grain; very friable; few fine roots; few fine mica flakes; common coarse pockets of very pale brown (10YR 8/4) loamy sand; very strongly acid.

The A horizon is 6 to 12 inches thick and is gray to very pale brown. The texture is predominantly fine sandy loam but ranges from sandy loam to loamy sand. The B horizon is 30 to 40 inches thick and is yellowish red to dark red. The texture is sandy clay loam or clay loam. The C horizon is pale-yellow to red loam, sandy loam, or loamy sand. The profile may have sandstone fragments throughout.

SHUBUTA SERIES.—The soils of the Shubuta series are acid and moderately well drained or well drained. They are on wide, steep and very steep side slopes in the eastern part of the county. These soils developed from stratified Coastal Plain loam, clay loam, clay, and clay shale. They represent slightly less than 1 percent of the total acreage of the county.

Shubuta soils are in the same area as Ruston, Cuthbert, and Ora soils and are similar to these soils. They have a higher clay content than Ruston soils, particularly in the subsoil. They have a thicker subsoil than Cuthbert soils. They differ from Ora soils in lacking a fragipan.

Shubuta soils are low in natural fertility, low in organic-matter content, and moderate to low in available water capacity. They have a moderately deep to deep root zone. Most of the acreage is still wooded, although many areas, generally small ones, have been cleared and are now in pasture. Shubuta soils are suited to pasture where the topography is not so steep that it is impossible to mow and to spread fertilizer. They are well suited to pine trees and are important to local agriculture.

The following representative profile of Shubuta loam is located about 12 miles east of Ripley on State Highway No. 4. The site is about 500 feet south of the highway, and about 100 feet east of the Columbia Gulf Transmission Company pipeline, SE¼SE¼ sec. 26, T. 4 S., R. 5 E.

A1—0 to 3 inches, black (10YR 2/1) loam; weak, fine, granular structure; very friable; common fine roots; few fine mica flakes; few coarse fragments of ironstone; slightly acid; abrupt, smooth boundary.

A2—3 to 7 inches, yellowish-brown (10YR 5/4) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; about 10 percent of the volume of this horizon is of strong-brown (7.5YR 5/8) material, obviously from the horizon beneath; few fine mica flakes; few coarse fragments of ironstone; strongly acid; abrupt, smooth boundary.

B1—7 to 13 inches, strong-brown (7.5YR 5/8) clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; few fine mica flakes; few fine fragments of ironstone; strongly acid; clear, smooth boundary.

B2t—13 to 27 inches, yellowish-red (5YR 5/6) heavy clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; about 2 percent of the volume of this horizon is fine and medium, grayish-brown (2.5Y 5/2) shale fragments, the volume of which increases with depth; few fine mica flakes; few fine fragments of ironstone; very strongly acid; gradual, smooth boundary.

B3—27 to 38 inches, yellowish-red (5YR 5/8) heavy clay loam; common, medium, faint mottles of reddish strong brown (7.5YR 5/6); weak, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; about 10 percent of the volume of this horizon is grayish brown (2.5Y 5/2) shale fragments, the volume of which increases with depth; few fine mica flakes; few fine fragments of ironstone; very strongly acid; gradual, smooth boundary.

C—38 to 60 inches +, strong-brown (7.5YR 5/8) heavy clay loam; common, medium, faint mottles of reddish yellow (7.5YR 6/8) and common, medium, distinct mottles of yellowish red (5YR 5/6); massive; friable; slightly plastic; slightly sticky; about 15 percent of the volume of this horizon is fine and medium fragments of shale; common fine mica flakes; extremely acid.

The surface soil is black to yellowish brown. The texture ranges from loam to sandy loam. The upper part of the subsoil is strong brown to yellowish red, and the texture ranges from clay loam to clay. The lower part of the subsoil is strong brown to yellowish red and has mottles of reddish yellow. Fragments of grayish-brown shale are common.

Red-Yellow Podzolic Soils Intergrading Toward Reddish-Brown Lateritic Soils

The Red-Yellow Podzolic soils intergrading toward Reddish-Brown Lateritic soils have a reddish-brown, friable subsoil underlain by dark-red, friable material. The Atwood soils are the only soils in this county that are so classified.

ATWOOD SERIES.—The soils of the Atwood series are acid and well drained. They are on narrow to broad ridgetops and upper side slopes in a belt known locally as "The Pontotoc Ridge," which is about 5 miles wide and extends the length of the east central part of the county. The slope is less than 12 percent. These soils developed from thin loess and friable, red Coastal Plain material. They represent about 1 percent of the total acreage of the county.

Atwood soils are in the same area as Ruston, Providence, Dulac, and Ora soils and are similar to these soils. They differ from Providence and Dulac soils in lacking a fragipan. They are siltier in the upper part of the profile than Ruston and Ora soils.

Atwood soils are moderate in natural fertility, low in organic matter content, and moderate to high in available water capacity. They have a deep root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Atwood soils are very well suited to crops and are important to local agriculture.

The following representative profile of Atwood silt loam is located in a cottonfield about 3 miles east of Blue Mountain. The site is 1 mile east of the Frank Gibson Lake, on an unnumbered State highway, and about 900 feet southeast of a 90-degree left turn in the highway, NW¼SW¼ sec. 11, T. 5 S., R. 3 E.

- Ap—0 to 6 inches, dark reddish-brown (5YR 3/3) silt loam; weak, fine, granular structure; friable; common, fine and coarse roots; some mixing of yellowish-red (5YR 4/6) material from B21t horizon; neutral; abrupt, smooth boundary.
- B21t—6 to 16 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium and fine, subangular blocky structure; friable; few fine roots; patchy clay films; strongly acid; clear, smooth boundary.
- B22t—16 to 28 inches, yellowish red (5YR 4/6) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; patchy clay films; common, fine, black coatings; very strongly acid; clear, smooth boundary.
- IIB23t—28 to 42 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; common, fine, black coatings; patchy clay films; very strongly acid; clear, smooth boundary.
- II24t—42 to 60 inches +, dark-red (2.5YR 3/6) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; common, fine, black coatings; thin, patchy clay films; very strongly acid; clear, smooth boundary.

The Ap horizon is 4 to 7 inches thick and is dark brown (7.5YR 4/2) to dark reddish brown (5YR 3/3). The upper part of the B horizon is yellowish red (5YR 4/6) to dark red (2.5YR 3/6). The lower part is dark reddish brown (2.5YR 3/4) to dark red (2.5YR 3/6). The texture is heavy silty clay loam, clay loam, or sandy clay.

Red-Yellow Podzolic Soils Intergrading Toward Low-Humic Gley Soils

The Red-Yellow Podzolic soils intergrading toward Low-Humic Gley soils have a gray and brown, gleylike mineral horizon and a low degree of textural differentiation in the lower part of the profile.

The Falkner soils are the only soils in this county that are so classified.

FALKNER SERIES.—The soils in the Falkner series are acid and somewhat poorly drained. They are on broad ridgetops and side slopes in an area known locally as "The Flatwoods," a belt about 4 miles wide extending from Union County on the south into Tennessee on the north. The slope is less than 8 percent. These soils developed from thin loess and mottled, plastic, fine-textured Coastal Plain materials. They represent less than 3 percent of the total acreage of the county.

Falkner soils are in the same area as Bude, Dulac, Wilcox, Cuthbert, and Tickfaw soils and are similar to these soils. They differ from Bude and Dulac soils in lacking a fragipan. They are siltier in the upper part of the profile than Wilcox and Cuthbert soils. They are better drained than Tickfaw soils.

Falkner soils are moderate in natural fertility, low in organic-matter content, and moderate to low in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Falkner soils are suited to many crops and are important to local agriculture.

The following representative profile of Falkner silt loam is located 3 miles east of Blue Mountain, about one-fourth mile southeast of the Frank Gibson Lake, and about 300 feet south of a local road, SW¼SW¼ sec. 10, T. 5 S., R. 3 E.

- O1—½ inch to 0, hardwood leaves.
- A1—0 to ½ inch, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; friable; common fine roots and few coarse roots; abrupt, smooth boundary.
- A2—½ inch to 6 inches, mottled yellowish-brown (10YR 5/4) and brown (10YR 5/3) silt loam; mottles are many, fine, and faint; weak, fine and medium, granular structure and weak, medium, subangular blocky structure; friable; common fine roots and few medium and coarse roots; few, fine, black concretions; root and wormholes filled with material from A and B horizons; clear, smooth boundary.
- B21—6 to 12 inches, yellowish-brown (10YR 5/4) silty clay loam; weak, fine and medium, subangular blocky structure; friable; few fine to coarse roots; few, fine, black concretions; clear, smooth boundary.
- B22—12 to 18 inches, mottled yellowish brown (10YR 5/4), light brownish-gray (10YR 6/2), and yellowish-red (5YR 4/8) heavy silt loam; mottles are many, fine, distinct and prominent; moderate, medium and fine, subangular blocky structure; friable; plastic; few fine to coarse roots; few, fine, black concretions; clear, smooth boundary.
- B23g—18 to 23 inches, light brownish-gray (2.5Y 6/2) silty clay loam; many, fine, distinct and prominent mottles of yellowish brown (10YR 5/4) and yellowish red (5YR 4/8); moderate, very fine and fine, subangular blocky structure; plastic; friable; few fine and coarse roots; few, fine, black concretions; common, fine, soft, red concretions; clear, smooth boundary.

IIB24t—23 to 28 inches, gray (5Y 5/1) silty clay; many, fine and medium, prominent mottles of yellowish red (5YR 4/8) and strong brown (7.5YR 5/6); moderate, medium, angular blocky structure; very plastic; sticky; few fine and coarse roots; few, fine, soft, red concretions; gradual, smooth boundary.

IIC1g—28 to 41 inches, gray (5Y 5/1) clay; many, fine and medium, distinct, yellowish-brown (10YR 5/4) mottles; massive; very plastic; sticky; few fine roots; few, fine, black, hard concretions; few slickensides about 1 inch wide; gradual, smooth boundary.

IIC2g—41 to 61 inches, mottled gray (5Y 5/1) and yellowish-brown (10YR 5/4) clay; mottles are many, fine and medium, and distinct; massive; very plastic; sticky; few fine roots; few, fine, black, brown, and red concretions; few small slickensides about 1 inch wide.

The surface horizon is 5 or 6 inches thick and is dark grayish brown to pale brown to brown and yellowish brown. The upper part of the subsoil is yellowish brown to light yellowish brown. The lower part is mottled with light gray, gray, pale brown, and yellowish brown and is at a depth of 17 to 26 inches. The texture of the C horizon ranges from heavy silty clay loam to clay, and the color from mottled gray and brown to light brownish gray and yellowish brown to grayish brown and yellowish brown.

Red-Yellow Podzolic Soils Intergrading Toward Grumusols

The Red-Yellow Podzolic soils intergrading toward Grumusols have in the lower horizons material that shrinks and swells with changes in moisture content.

The Wilcox soils are the only soils in this county that are so classified.

Wilcox Series.—The soils in the Wilcox series are acid and somewhat poorly drained. They are on steep and very steep side slopes in the western half of the county. The slope is less than 45 percent. These soils developed from Coastal Plain shale of the Porters Creek formation or from similar materials. They represent more than 4 percent of the total acreage of the county.

Wilcox soils are in the same area as Cuthbert, Providence, Falkner, Bude, and Dulac soils and are similar to these soils. They are more poorly drained than Cuthbert soils. They are less silty in the upper part of the profile than Falkner soils. They differ from Bude, Providence, and Dulac soils in lacking a fragipan.

Wilcox soils are low in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a shallow root zone. For the most part, they are still in woodland. A considerable acreage, however, has been cleared and is now in pasture and row crops. The areas that are not so steep that mechanized equipment cannot be used to mow and to spread fertilizer are suited to either grass or trees. Other areas are suited only to trees. Wilcox soils are important to local agriculture.

The following representative profile of Wilcox silt loam is located in a woods about 2½ miles west of Cotton Plant on a gravel road, four-tenths mile north of an intersecting local road, and about 50 yards east of the local roadway, SE¼NW¼ sec. 36, T. 5 S., R. 2 E.

Ap 0 to 6 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; friable; common medium roots; extremely acid; abrupt, smooth boundary.

B21—6 to 10 inches, yellowish red (5YR 4/6) silty clay; few, fine, distinct mottles of gray (10YR 6/1) and pale brown (10YR 6/3); moderate, fine and medium, subangular blocky structure; friable; plastic; slightly sticky; many fine roots; very strongly acid; gradual, smooth boundary.

B22—10 to 22 inches, mottled yellowish-red (5YR 4/6), gray (10YR 6/1), and yellowish-brown (10YR 5/4) clay; strong, fine and medium, subangular blocky structure; firm; plastic; sticky; clear, smooth boundary.

B23—22 to 30 inches, mottled light brownish-gray (10YR 6/2), brown (10YR 5/3), strong-brown (7.5YR 5/6), and red (2.5YR 4/6) clay; strong, fine and medium, subangular blocky structure; firm; plastic; sticky; very strongly acid.

IIC—30 to 40 inches +, gray (10YR 5/1), partially weathered clay shale.

The A horizon is very dark brown to dark yellowish-brown. The texture ranges from silt loam to sandy loam. The matrix color of the upper part of the subsoil, commonly to a depth of 15 to 20 inches, is yellowish red but ranges from yellowish brown to red and is distinctly mottled with shades of gray and brown. The texture is silty clay or clay. In places the uppermost 10 inches is mottle free. Below a depth of about 20 inches, the grayer colors dominate and the mottles are commonly shades of brown and red. Depth to the clay shale ranges from about 12 to 40 inches. The more shallow profiles of Wilcox soils, in which clay shale is at a depth of 18 to 24 inches, commonly have browner base colors and fewer gray mottles and have many shale fragments an inch or more in diameter embedded in the clayey subsoil.

GRAY-BROWN PODZOLIC SOILS

This great soil group consists of soils that have a comparatively thin organic and organic-mineral horizon over a grayish-brown, leached A horizon that is underlain by an illuvial B horizon. The soils of this group developed under deciduous forest in a temperate-moist climate. They generally have a high cation-exchange capacity and a moderately high percentage of base saturation. The subsoil has moderate, subangular blocky structure and moderate to high chroma.

In Tippah County the Gray-Brown Podzolic soils have a reddish-brown or yellowish-red B horizon and a fragipan in the lower part of the solum. The Providence soils are the only soils in this county that are so classified.

Providence Series.—The soils of the Providence series are acid, are moderately well drained, and have a compact, brittle fragipan. They are on narrow to broad ridgetops and upper side slopes in the western two-thirds of the county. The slope is less than 12 percent. These soils developed from thin loess and friable, red Coastal Plain material. They represent about 5 percent of the total acreage of the county.

Providence soils are in the same area as Atwood, Ruston, Cuthbert, Bude, and Dulac soils and are similar to these soils. They differ from Atwood, Ruston, and Cuthbert soils in having a brittle, compact fragipan. They are better drained than Bude soils. As compared with Dulac soils, they have a sandier, less clayey fragipan and are sandier beneath the fragipan.

Providence soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a moderately deep root zone. For the most part, they have been cleared of trees and are now in row crops and in pasture. Providence soils

are well suited to crops and are important to local agriculture.

The following representative profile of Providence silt loam is located in a woods 4 miles southeast of Ripley, about one-eighth mile south of Wier's Chapel on State Highway No. 370, about one fourth mile east on a private road, and then about 100 yards north, SE¼SW¼ sec. 28, T. 4 S., R. 4 E.

Ap—0 to 5 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; common fine roots; few medium roots; common, fine, empty root channels or worm channels; a little mixing of B material in this horizon; strongly acid; clear, smooth boundary.

A and B—5 to 8 inches, mixed brown (10YR 5/3) and dark-brown (7.5YR 4/4) heavy silt loam; weak, medium and coarse, subangular blocky structure; common fine roots; strongly acid; clear, smooth boundary.

B21t -8 to 20 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; few fine and medium roots; few, fine, empty root channels or worm channels; patchy clay films on peds; strongly acid; clear, smooth boundary.

B22t—20 to 27 inches, yellowish-red (5YR 4/6) heavy silt loam; common, medium, fine mottles of strong brown (7.5YR 5/6); moderate, fine and medium, subangular blocky structure; friable; few fine roots; patchy clay films on some peds and in pores; few fine stains of manganese; strongly acid; clear, smooth boundary.

B23 and A'2x—27 to 36 inches, yellowish-red (5YR 4/6) silt loam; common, medium, faint mottles of strong brown (7.5YR 5/6) and few, fine, distinct mottles of gray (10YR 6/1); moderate, medium, subangular blocky structure; friable; compact and brittle; few fine roots; thin, gray silt coats on some peds; common fine voids; very strongly acid; clear, smooth boundary.

IIB'x—36 to 58 inches +, red (2.5YR 4/6) light clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) polygonal cracks; moderate, medium, subangular blocky structure; friable; few fine roots; common polygonal cracks filled with strong-brown, light textured material extending downward from fragipan; few, fine, empty root channels or worm channels; very strongly acid.

The surface layer is 2 to 8 inches thick and is pale brown to dark brown. In the B horizon the color ranges from yellowish red to strong brown to yellowish brown. The fragipan is at a depth of 18 to 28 inches. The base color of the fragipan is reddish brown or yellowish red to yellowish brown, and the mottles are yellowish brown to gray. The texture ranges from silt loam to sandy loam. In the horizon beneath the fragipan, the color ranges from dark red to strong brown and the texture from light clay loam to sandy loam.

Intrazonal order

Soils in the intrazonal order have more or less well developed soil characteristics that reflect the dominating influence of some local factor of relief or parent material over the normal effects of climate and vegetation. Each great soil group within the intrazonal order is likely to be closely associated with two or more great soil groups that are within the zonal order. The intrazonal order is represented in this county by the Low-Humic Gley and Planosol great soil groups.

LOW-HUMIC GLEY SOILS

The soils of this great soil group are poorly drained. They have a very thin surface horizon, moderately high in organic-matter content, over a mottled gray and brown, gleylike mineral horizon that is little different from the surface horizon in texture. Low-Humic Gley soils in this county range from loamy sands to clays, and the parent materials vary widely in physical and chemical properties. These soils occur largely under a natural cover of swamp forest and, in some areas, marsh plants. Reaction ranges from medium acid to very strongly acid.

The Low-Humic Gley great soil group is represented in this county by the Bibb, Chastain, Falaya, Mantachie, Urbo, and Waverly series.

BIBB SERIES.—The soils of the Bibb series are acid and poorly drained. They are in the low lying areas of narrow and broad stream bottoms in the eastern third of the county. These soils developed entirely from friable, predominantly coarse-textured alluvium of Coastal Plain origin. They represent almost 1 percent of the total acreage of the county.

Bibb soils are in the same area as Mantachie and Chastain soils and Mixed alluvial land and are similar to these soils and this land type. They are more poorly drained than Mantachie soils and contain more gray colors and less brown in the upper part of the solum. They are lighter textured throughout the profile than Chastain soils. As compared with Mixed alluvial land, they are more poorly drained and lack the alternating layers of medium-textured and coarse-textured material within the profile.

Bibb soils are low in natural fertility, low to fairly high in organic-matter content, and moderate to low in available water capacity. They have a very shallow root zone. Most of the acreage is used for growing trees or for pasture; the rest is row cropped. Bibb soils are well suited to trees and pasture plants and are important to local agriculture.

The following representative profile of Bibb silt loam is located east of Pine Grove in a pasture about one-half mile south of the Concord Baptist Church and about one-fourth mile south of the bridge across Dry Creek, on a local road, SW¼SW¼ sec. 12, T. 5 S., R. 5 E.

Ap1—0 to 3 inches, dark yellowish brown (10YR 4/4) light silt loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

Ap2—3 to 7 inches, grayish brown (10YR 5/2) loam; common, medium, faint mottles of yellowish brown (10YR 5/4); massive in place but breaks into weak, fine, subangular blocky structure when disturbed; friable; few fine roots; few, medium, soft, brownish-black concretions; very strongly acid; clear, smooth boundary.

C1g -7 to 13 inches, light brownish-gray (10YR 6/2) loam; few, fine and medium, faint mottles of yellowish brown (10YR 5/6); massive in place but breaks into weak, fine, subangular blocky structure when disturbed; friable; few fine roots; few, medium, brownish-black concretions; strongly acid; clear, smooth boundary.

C2g—13 to 18 inches, gray (10YR 6/1) loam; common, medium, distinct mottles of brown (10YR 5/3) and few, medium, distinct mottles of yellowish brown (10YR 5/6); massive in place but breaks into weak, fine, subangular blocky structure when disturbed; friable; few fine roots; few, medium, brownish-black concretions; strongly acid; clear, smooth boundary.

C3g–18 to 31 inches, light gray (10YR 7/1) light loam; common, fine and medium, distinct mottles of brown (10YR 5/3) and few, fine, distinct mottles of yellowish brown (10YR 5/6); massive in place but breaks into weak, fine, subangular blocky structure when disturbed; friable; few fine roots; strongly acid; clear smooth boundary.

C4g—31 to 44 inches, light-gray (10YR 7/1) sandy loam; common, fine and medium, distinct mottles of grayish brown (10YR 5/2) and few, fine, distinct mottles of yellowish brown (10YR 5/6); massive in place but breaks into weak, fine, subangular blocky structure when disturbed; friable; few fine roots; many, coarse, soft, brownish-black concretions; strongly acid; clear, smooth boundary.

C5g—44 to 56 inches +, white (10YR 8/2) sandy loam; single-grain; very friable; few fine roots; common, medium, soft, brownish-black concretions; strongly acid.

The A horizon is dark gray to dark brown. The texture ranges from sandy loam to silt loam. The C horizon is light gray or light brownish gray and is commonly mottled with brownish yellow and dark yellowish brown. This horizon is commonly loam or sandy loam in texture, but it may consist of thinly stratified layers of sandy clay loam, loam, silty clay loam, silt loam, or sandy loam.

Chastain Series.—The soils of the Chastain series are acid and poorly drained. They are in narrow and broad stream bottoms throughout the county. These soils developed from fine-textured alluvium of Coastal Plain origin. They represent almost 1 percent of the total acreage of the county.

Chastain soils are in the same area as Falaya, Urbo, Waverly, Mantachie, and Bibb soils and are similar to these soils. They are more poorly drained than Falaya, Urbo, and Mantachie soils. They are finer textured, particularly in the C horizon, than Waverly and Bibb soils.

Chastain soils are low in natural fertility, low to fairly high in organic-matter content, and moderate in available water capacity. They have a very shallow root zone. Much of the acreage has been cleared of trees and is now in row crops and in pasture. Chastain soils are suited to pasture and late-season row crops and are important to local agriculture.

The following representative profile of Chastain silty clay loam is located in an idle field 2 miles north of Blue Mountain. It is one half mile south of the concrete bridge across Tippah Creek, on a local road, and about 125 yards west of the roadway, SE¼SE¼ sec. 25, T. 4 S., R. 2 E.

Ap 0 to 5 inches, dark-brown (10YR 3/3) heavy silt loam; common, fine, faint mottles of grayish brown (10YR 5/2); weak, fine, granular structure; friable; common fine roots; few, fine, brownish-black concretions; very strongly acid; abrupt, smooth boundary.

C1g—5 to 13 inches, light brownish-gray (10YR 6/2) silty clay; common, fine, distinct, yellowish-brown mottles (10YR 5/6) and common, fine, faint, brown (10YR 5/3) mottles; massive in place but when removed breaks into weak and strong, medium, subangular blocky structure; slightly sticky; slightly plastic; few fine roots; few, fine, brownish-black concretions; few fine fragments of charcoal; very strongly acid; clear, smooth boundary.

C2g—13 to 33 inches, grayish brown (10YR 5/2) silty clay; common, fine, distinct mottles of yellowish red (5YR 5/8) and yellowish brown (10YR 5/4); massive in place but when removed breaks into moderate, medium and coarse, subangular blocky structure; sticky; plastic; few fine roots; few, fine, soft, brown concretions; few thin silt coats on ped surfaces; sand grains on ped surfaces in lower part of horizon; very strongly acid; clear, smooth boundary.

C3g—33 to 51 inches, grayish-brown (2.5Y 5/2) clay loam; many, fine, distinct mottles of yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6); massive in place but when removed breaks into weak, fine and medium, subangular blocky structure; friable; few fine roots; sand grains on fragment surfaces throughout the horizon; very strongly acid; clear, smooth boundary.

C4g—51 to 60 inches +, mottled yellowish-red (5YR 5/6), strong-brown (7.5YR 5/6), and grayish-brown (10YR 5/2) clay loam; massive in place but breaks into weak, fine and medium, subangular blocky structure; slightly plastic; slightly sticky; few fine roots; few, fine, brownish-black concretions; very strongly acid.

The Ap horizon is 3 to 5 inches thick. The texture is predominantly heavy silt loam but ranges from silty clay loam or clay loam to sandy loam. The color is dark grayish brown (10YR 4/2) to mottled dark brown (10YR 3/3) and grayish brown (10YR 5/2). In the Cg horizons the color ranges from light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) to mottled yellowish brown (10YR 5/4) and grayish brown (2.5Y 5/2), and the texture from silty clay loam or clay loam to clay.

Falaya Series.—The soils of the Falaya series are acid and somewhat poorly drained. They are on broad and narrow stream bottoms throughout the western two-thirds of the county. These soils developed in thick beds of silty alluvium washed from loessal soils. They represent about 10 percent of the total acreage of the county.

Falaya soils are in the same area as Collins, Waverly, Chastain, and Urbo soils and Mixed alluvial land and are similar to these soils and this land type. They are more poorly drained than Collins soils and are better drained than Waverly soils. They are siltier in the upper part of the profile than Chastain and Urbo soils. They are more uniformly silty throughout the profile than Mixed alluvial land.

Falaya soils are moderate in natural fertility, low in organic matter content, and moderate in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Falaya soils are suited to crops and are very important to local agriculture.

The following representative profile of Falaya silt loam is located in a field 4 miles west of Ripley, about 100 yards west of a local roadway, and about one-half mile north of Eddings Hill, NW¼NE¼ sec. 18, T. 4 S., R. 3 E.

Ap—0 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; common fine roots; many, medium, brownish-black stains; very strongly acid; abrupt, smooth boundary.

C1 7 to 11 inches, dark-brown (10YR 4/3) silt loam; common, fine, faint mottles of pale brown (10YR 6/3) and few, fine, distinct mottles of dark brown (7.5YR 4/4); massive, breaking to weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

C2—11 to 20 inches, grayish-brown (10YR 5/2) silt loam; common, fine, faint mottles of light gray (10YR 7/2) and few, fine, distinct mottles of yellowish brown (10YR 5/4); massive, breaking to weak, fine, granular structure; friable; few fine roots; many, medium brownish-black stains; few, fine, empty root channels or worm channels; strongly acid; clear, smooth boundary.

C3g—20 to 27 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/6); massive, breaking to weak, fine, granular structure; friable; few fine roots; many, medium, brownish-black stains; few, fine, empty root channels or worm channels; strongly acid; clear, smooth boundary.

C4g—27 to 45 inches, gray (10YR 6/1) heavy silt loam; common, fine, distinct mottles of yellowish brown (10YR 5/4); massive, breaking to weak, fine, granular structure; few fine roots; friable; many, medium, brownish-black stains; few, fine, empty root channels or worm channels; strongly acid; clear, smooth boundary.

C5g 45 to 55 inches +, mottled gray (10YR 6/1), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; few, fine, empty root channels or worm channels; strongly acid.

The A horizon is 5 to 7 inches thick and is dark grayish brown, brown, or dark brown. In the upper part of the C horizon, the color is dark grayish brown or brown, and in the lower part it is mottled brown, dark brown, pale brown, light brownish gray, and gray. The depth to mottling is commonly between 8 and 14 inches but ranges from 6 to 18 inches. The texture in the lower part of the C horizon is commonly silt loam, but it may grade to heavy silty clay loam below a depth of 20 inches near areas of Urbo and Chastain soils.

MANTACHIE SERIES.—The soils of the Mantachie series are acid and somewhat poorly drained. They are on narrow and broad stream bottoms in the eastern one-third of the county. These soils developed from friable alluvium of Coastal Plain origin. They represent more than 2 percent of the total acreage of the county.

Mantachie soils are in the same area as Iuka, Bibb, and Chastain soils and Mixed alluvial land and are similar to these soils and this land type. They are more poorly drained than Iuka soils and better drained than Bibb soils. They are also better drained than Chastain soils and are sandier throughout the profile. They are more uniformly loamy throughout the profile than Mixed alluvial land.

Mantachie soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is in row crops and in pasture. Mantachie soils are suited to crops and are important to local agriculture.

The following representative profile of Mantachie silt loam is located in a field 5 miles east of Pine Grove. The site is about one-fourth mile north of the Dry Creek community club building, along a local road, and about one-fourth mile east along an intersecting local road, about 450 feet south of the roadway, and about 200 feet west of the Dry Run Canal, SE¼NW¼ sec. 23, T. 5 S., R. 5 E.

Ap—0 to 7 inches, brown or dark-brown (10YR 4/3) silt loam; weak, fine and medium, granular structure; very friable; few fine roots; few fine mica flakes; very strongly acid; abrupt, smooth boundary.

C1—7 to 12 inches, brown or dark-brown (10YR 4/3) loam; few, fine, faint mottles of pale brown (10YR 6/3); weak, fine and medium, granular structure; very friable; few fine roots; few fine mica flakes; very strongly acid; clear, smooth boundary.

C2—12 to 23 inches, mottled yellowish-brown (10YR 5/6), pale-brown (10YR 6/3), and yellowish-brown (10YR 5/8) loam; structureless to weak, fine and medium, subangular blocky structure; very friable; few fine roots; few fine mica flakes; very strongly acid; gradual, smooth boundary.

C3g—23 to 35 inches, light brownish gray (10YR 6/2) loam; common, fine and medium, distinct mottles of yellowish brown (10YR 5/6); structureless, breaking to weak, fine and medium, subangular blocky structure; friable; few fine roots; few fine mica flakes; very strongly acid; gradual, smooth boundary.

C4g 35 to 43 inches, gray (10YR 6/1) fine sandy loam; common, medium, distinct mottles of yellowish brown (10YR 5/6); massive, breaking to weak, fine and medium, subangular blocky structure; friable; common, coarse, firm, yellowish brown concretions with very dark brown centers; few fine mica flakes; very strongly acid; clear, smooth boundary.

C5g—43 to 51 inches +, gray (10YR 6/1) loam; common, medium, faint mottles of pale brown (10YR 6/3) and common, medium, distinct mottles of yellowish brown (10YR 5/6); massive; friable; many, coarse, firm, yellowish-brown concretions with very dark brown centers; few fine mica flakes; very strongly acid.

The A horizon is 7 or 8 inches thick and is dark brown, brown, or yellowish brown. The texture ranges from silt loam to loamy sand. The upper part of the C horizon is dark yellowish brown to brown and either lacks mottles or has many mottles of pale brown and brown. The lower part of the C horizon is commonly light silt loam or loam mottled with brown, grayish brown, pale brown, and yellowish brown. Mottles generally occur at a depth of more than 12 inches. In the lower part of the profile the color is commonly grayish brown, light brownish gray, or pale brown, and the texture is light silt loam or heavy loam.

URBO SERIES.—The soils of the Urbo series are acid and somewhat poorly drained. They are in narrow and broad stream bottoms in the western two-thirds of the county. These soils developed from plastic, fine-textured Coastal Plain alluvium. They represent more than 1 percent of the total acreage of the county.

Urbo soils are in the same area as Collins, Falaya, Waverly, and Chastain soils and are similar to these soils. They have a higher clay content, particularly in the upper part of the profile, than Collins, Falaya, and Waverly soils. They are better drained than Chastain soils.

Urbo soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Urbo soils are suited to crops and are important to local agriculture.

The following representative profile of Urbo silty clay loam is located in a field about 1½ miles north of Blue Mountain, about one-half mile east of Deen Town Church, along a gravel road, and about 150 yards south of the roadway, NE¼NE¼ sec. 36, R. 2 E., T. 4 S.

Ap1—0 to 6 inches, dark-brown (10YR 3/3) light silty clay loam; weak, fine and medium, granular structure; friable; slightly plastic; slightly sticky; few fine roots; few, fine, black concretions; very strongly acid; abrupt, smooth boundary.

Ap2—6 to 10 inches, dark-brown (10YR 4/3) silty clay loam; common, medium, faint mottles of brown (10YR 5/3); massive when wet or moist, and breaks to weak, fine and medium, subangular blocky peds when slightly moist or dry; friable; very plastic;

sticky; few fine roots; common, medium and coarse, brown and black concretions; very strongly acid; clear, smooth boundary.

C1g—10 to 15 inches, grayish-brown (2.5Y 5/2) silty clay; common, medium, faint mottles of brown (10YR 5/3); massive when wet or moist, and breaks to moderate, medium and fine, subangular blocky peds when slightly moist or dry; friable; very plastic; sticky; few fine roots; few, fine, brown and black coatings and concretions; very strongly acid; clear, smooth boundary.

C2g—15 to 25 inches, grayish-brown (2.5Y 5/2) silty clay; common, medium, faint mottles of yellowish brown (10YR 5/6); massive when wet or moist, and breaks to weak, medium and fine, subangular blocky peds when slightly moist or dry; friable; very plastic; sticky; few fine roots; few, fine, brown and black concretions; few gray silt coatings on peds and in cracks.

C3—25 to 42 inches +, grayish-brown (2.5Y 5/2) silty clay loam; common, medium, faint mottles of yellowish brown (10YR 5/6) and few, fine, distinct mottles of strong brown (7.5YR 5/8); massive when wet or moist, and breaks to weak, medium and fine, subangular blocky peds when slightly moist or dry; firm; very plastic; sticky; few fine roots; few, fine, brown and black concretions; very strongly acid.

The A horizon is 6 to 14 inches thick. The color ranges from very dark grayish brown to dark yellowish brown, and the texture from silt loam to silty clay loam. The upper part of the C horizon is 10 to 20 inches thick. The color ranges from light brownish gray to dark yellowish brown, the texture is either silty clay loam or clay loam, and there are gray drainage mottles. The lower part of the C horizon is gray or light brownish gray . The texture ranges from silty clay loam to clay.

Waverly Series.—The soils of the Waverly series are acid and poorly drained. They are in narrow and broad stream bottoms in the western two-thirds of the county. These soils developed from thick beds of silty alluvium washed from loessal upland soils. They represent less than 2 percent of the total acreage of the county.

Waverly soils are in the same area as Collins, Falaya, Urbo, and Chastain soils and are similar to these soils. They are more poorly drained than Collins and Falaya soils. They are siltier, particularly in the upper part of the profile, than Urbo and Chastain soils.

Waverly soils are low in natural fertility, low in organic-matter content, and moderate to low in available water capacity. They have a very shallow root zone. Much of the acreage has been cleared of trees and is now in pasture or row crops. Waverly soils are suited to grasses and hardwood trees and are important to local agriculture.

The following representative profile of Waverly silt loam is located about 1½ miles south of Walnut. The site is in a pasture about one-fourth mile southwest of the bridge across Hurricane Creek, on State Highway No. 15, NW¼SW¼ sec. 8, T. 2 S., R. 4 E.

Apg—0 to 5 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct mottles of dark yellowish brown (10YR 4/4) and brown (7.5YR 5/4); brown stains around old roots; weak, fine, granular structure; friable; common fine roots; strongly acid; abrupt, smooth boundary.

C1g—5 to 14 inches, grayish-brown (10YR 5/2) silt loam; many, fine, distinct mottles of dark yellowish brown (10YR 4/4); weak, fine, subangular blocky structure; friable; few fine roots; common, fine, black and brown stains; strongly acid; clear, smooth boundary.

C2g—14 to 22 inches, mottled grayish-brown (10YR 5/2), gray (10YR 5/1), and brown (10YR 4/3) silty clay loam; few fine stains of yellowish red (5YR 4/6) and many fine stains of dark brown (10YR 4/3); massive; friable; few fine roots; few, fine, black stains; strongly acid; clear, smooth boundary.

C3g 22 to 30 inches, grayish brown (2.5YR 5/2) silty clay loam; common, fine, distinct mottles of yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4); massive; friable; slightly sticky; slightly plastic; few fine roots; strongly acid; clear, smooth boundary.

C4g—30 to 43 inches, gray (10YR 6/1) silty clay loam; common, fine, distinct mottles of brown (10YR 5/3) and strong brown (7.5YR 5/6); massive; friable; slightly sticky; slightly plastic; few fine roots; strongly acid.

The A horizon is dark gray or grayish brown and may be mottled to the surface, particularly in pastured areas. The C horizon is gray or grayish brown and is commonly mottled with brownish yellow and dark yellowish brown. The texture ranges from silt loam to silty clay loam.

PLANOSOLS

Planosols have one or more horizons abruptly separated from and sharply contrasting to an adjacent horizon because of cementation, compaction, or high clay content.

The Planosols in Tippah County commonly have a fluctuating water table and a compacted horizon that lies beneath a moderately well developed B horizon in which the percentage of clay is higher than in the A horizon.

The Planosol great soil group is represented in this county by the Almo, Bude, Hatchie, and Tickfaw soils.

Almo Series.—The soils of the Almo series are acid, are poorly drained, and have a compact and brittle fragipan. They are on broad, nearly level terraces in the larger valleys near large stream bottoms. These soils developed from mixed sandy and silty alluvium washed from upland soils that developed from loess and sandy Coastal Plain material. They represent about one-tenth of 1 percent of the total acreage of the county.

Almo soils are in the same area as Bude, Falkner, Hatchie, and Wilcox soils and are similar to these soils. They are more poorly drained than Hatchie and Bude soils. They are grayer in the upper part of the profile than Wilcox and Falkner soils, and they have a fragipan.

Almo soils are low in natural fertility, low in organic-matter content, and low in available water capacity. They have a very shallow root zone. Most of the acreage has been cleared of trees and is now in pasture and row crops.

The following representative profile of Almo silt loam is located in a pasture at Falkner. The site is about 120 yards northwest of the intersection of State Highway No. 15 and the main street of downtown Falkner, NW¼NE¼ sec. 12. T. 3 S., R. 3 E.

Ap1 0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint mottles of dark yellowish brown (10YR 4/4); weak, fine, granular structure; very friable; common fine roots; few, fine, brownish-black concretions; slightly acid; abrupt, smooth boundary.

Ap2g—1 to 5 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/6) and common, fine, distinct mottles of brown or dark brown (7.5YR 4/4); weak, fine, granular structure; friable; common fine roots; few, fine, brownish-black concretions; mildly alkaline; abrupt, smooth boundary.

Ap3g—5 to 7 inches, pale-brown (10YR 6/3) silt loam; many, fine, distinct mottles of yellowish brown (10YR 5/6) and few, medium, distinct mottles of brown or dark brown (10YR 4/3); weak, fine, granular structure; friable; few fine roots; few, fine, brownish-black concretions; neutral; abrupt, smooth boundary.

B21g—7 to 15 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct mottles of brown or dark brown (7.5YR 4/4) and many distinct mottles of yellowish brown (10YR 5/6); weak and moderate, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, brownish-black concretions; medium acid; clear, smooth boundary.

B22g—15 to 22 inches, gray (10YR 6/1) heavy silt loam; many, medium, distinct mottles of brownish yellow (10YR 6/6) and common, medium, distinct mottles of strong brown (7.5YR 5/6); moderate, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, brownish black concretions; strongly acid; clear, smooth boundary.

A'2gx and B'21x—22 to 28 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, fine, distinct mottles of dark yellowish brown (10YR 4/4) and few, fine, distinct mottles of yellowish brown (10YR 5/6); moderate, fine and medium, subangular blocky structure; compact and brittle; few fine roots; fine voids common; few, fine, brownish-black concretions; vertical, polygonal cracks filled with grayish silty material, beginning in this layer and extending downward throughout the lower part of the profile; strongly acid; clear, irregular boundary.

B'22gt—28 to 38 inches, grayish-brown (10YR 5/2) silty clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6) and few, fine, distinct mottles of yellowish red (5YR 5/6); moderate, coarse, angular blocky structure that breaks to weak and moderate, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; few, fine and medium, brownish-black concretions; thin clay films; vertical, polygonal cracks filled with grayish material; strongly acid; clear, smooth boundary.

B'23g—38 to 52 inches, mottled grayish-brown (10YR 5/2), yellowish-brown (10YR 5/6), and brown or dark-brown (7.5YR 4/4) heavy silty clay loam; weak and moderate, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; few, fine and medium, brownish black concretions; vertical, polygonal cracks filled with grayish material; strongly acid; clear, smooth boundary.

B'24g—52 to 60 inches +, mottled yellowish brown (10YR 5/6), gray (10YR 6/1), and grayish-brown (2.5Y 5/2) heavy silty clay loam; weak and moderate, fine and medium, subangular blocky structure; friable; slightly plastic; slightly sticky; few fine roots; few, fine and medium, brownish-black concretions; vertical, polygonal cracks filled with grayish material; very strongly acid.

The A horizon is 6 to 12 inches thick and is dark gray (10YR 4/1) to dark yellowish brown (10YR 4/4) to pale brown (10YR 6/3). The texture is silt loam or loam. The B horizon is generally light-gray (10YR 7/1) to grayish-brown (10YR 5/2) heavy silt loam mottled with yellowish brown (10YR 5/6) to strong brown (7.5YR 5/6). The fragipan is at a depth of about 22 inches. It is underlain by mottled gray (10YR 6/1) and brown (10YR 5/3) heavy silty clay loam to sandy clay loam.

Bude Series.—The soils of the Bude series are acid, are somewhat poorly drained, and have a compact and brittle fragipan. They are on broad ridgetops in the western two-thirds of the county. The slope is less than 5 percent. These soils developed from thin loess and friable or plastic Coastal Plain material. They represent almost 1 percent of the total acreage of the county.

Bude soils are in the same area as Falkner, Dulac, Providence, Wilcox, and Tickfaw soils and are similar to these soils. They differ from Falkner, Wilcox, and Tickfaw soils in having a fragipan. They are more poorly drained than Dulac and Providence soils and have a less brown, lighter colored B horizon.

Bude soils are moderate in natural fertility, low in organic-matter content, and moderate to low in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Bude soils are suited to crops and are important to local agriculture.

The following representative profile of Bude silt loam is located in a pasture 2½ miles southwest of Falkner and about 250 feet north of a gravel road, SW¼SW¼ sec. 10, T. 3 S., R. 3 E.

Ap—0 to 7 inches, mottled dark grayish-brown (10YR 4/2), brown (10YR 5/3), and pale-brown (10YR 6/3) silt loam; mottles are many, fine, faint; weak, fine and medium, granular structure; friable; few fine roots; few, fine, black and brown concretions; brown stains around roots; clear, smooth boundary.

B21—7 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few root and wormholes filled with material from Ap horizon; few, fine, black and brown concretions; clear, smooth boundary.

B22—12 to 20 inches, mottled yellowish-brown (10YR 5/6), light gray (10YR 7/1), and strong-brown (7.5YR 5/6) heavy silt loam; mottles are many, fine and medium, faint and distinct; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, soft, brown and black concretions; clear, smooth boundary.

A'2 and B3—20 to 24 inches, mottled pale olive (5Y 6/3), yellowish-brown (10YR 5/6), and light brownish-gray (2.5Y 6/2) heavy silt loam; mottles are many, fine and medium, distinct; weak, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; common, fine, brown and black concretions; few fine voids; clear, smooth boundary.

A'2x—24 to 28 inches, light-gray (10YR 7/1) heavy silt loam; many, fine, distinct, pale-olive (5Y 6/3) and yellowish-brown (10YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; compact and brittle; slightly plastic; few fine roots; common, fine, brown concretions; common fine voids; common fine seams less than 1 inch wide of gray (10YR 6/1) silty clay loam; overall peds are coated with light-gray (10YR 7/1) silt; clear, irregular boundary.

B'21tgx—28 to 46 inches, gray (2.5Y 6/0) silty clay loam; many, fine and medium, distinct mottles of yellowish brown (10YR 5/6); moderate, medium and coarse angular blocky structure; plastic; compact and brittle; firm; few fine roots; common, fine, brown concretions; patchy clay films in cracks; light gray (10YR 7/1) silt coatings on few of peds and in few cracks; common vertical cracks filled with gray (2.5Y 6/0) silty clay; gradual, irregular boundary.

IIB'22tgx—46 to 62 inches +, gray (2.5Y 6/0) clay loam; many, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, coarse, angular blocky structure; friable to firm; slightly plastic; few fine roots; common, fine, brown concretions; patchy clay films in cracks; common vertical cracks less than 1 inch wide filled with gray (2.5Y 6/0) silty clay.

The A horizon is 5 to 7 inches thick. The color ranges from dark brown and dark grayish brown to brown and

to pale brown. The texture of the B horizon ranges from silt loam to silty clay loam, and the color from strong brown to pale brown to yellowish brown. This horizon has drainage mottles below a depth of about 12 inches. The depth to the fragipan ranges from 16 to 24 inches. The fragipan may be silt loam or silty clay loam in texture and is commonly mottled with a mixture of colors ranging from pale olive brown to light brownish gray and light gray to yellowish brown. The horizons beneath the fragipan are silty clay loam or clay loam. The color ranges from dominantly gray to mottled strong brown, yellowish brown, and gray.

HATCHIE SERIES.—The soils of the Hatchie series are acid, are somewhat poorly drained, and have a compact and brittle fragipan. They are on broad terraces near all of the large stream bottoms. The slope is less than 5 percent. These soils developed from mixed sandy and silty alluvium washed from soils derived from loess and sandy Coastal Plain material. They represent less than 1 percent of the total acreage of the county.

Hatchie soils are in the same area as Providence, Dulac, Bude, Falkner, Cuthbert, Wilcox, Freeland, and Ora soils and are similar to these soils. They are more poorly drained than Providence, Dulac, Freeland, Ora, and Cuthbert soils. They are sandier in the upper part of of the profile than Bude soils. They differ from Wilcox and Falkner soils in having a fragipan.

Hatchie soils are moderate in natural fertility, low in organic-matter content, and moderate in available water capacity. They have a shallow root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Hatchie soils are suited to crops and are important to local agriculture.

The following representative profile of Hatchie silt loam is located about 4½ miles west of Cotton Plant, along a gravel road which enters Benton County. The site is in a pasture about six-tenths mile east of the Benton County line and about 150 feet south of the roadway, NW¼NE¼ sec. 27, T. 5 S., R. 2 E.

Ap—0 to 6 inches, mixed dark-brown (10YR 4/3) and yellowish-brown (10YR 5/4) light silt loam containing considerable fine sand; weak, fine, granular structure; very friable; many fine roots; few, fine, brownish-black concretions; medium acid; abrupt, wavy boundary.

B21—6 to 11 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; few medium root or animal channels filled with material from the horizons above; strongly acid; clear, wavy boundary.

B22—11 to 14 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, faint mottles of brownish yellow (10YR 6/6) and common, fine and medium mottles of light brownish gray (10YR 6/2); moderate, fine and medium, subangular blocky structure; friable; few, fine, brownish-black concretions; few medium root or animal channels filled with material from the Ap horizon; strongly acid; clear, wavy boundary.

B23g—14 to 19 inches, mottled yellowish brown (10YR 5/4), light brownish-gray (10YR 6/2), and brownish-yellow (10YR 6/6) silt loam; moderate, fine and medium, subangular blocky structure; friable; few, fine, brownish-black concretions; few to common, brownish-black stains; few fine roots; strongly acid; clear, wavy boundary.

IIA'2xg and IIB'21x—19 to 31 inches, gray (10YR 6/1) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6); moderate, fine and medium, subangular blocky structure; compact and brittle; few, fine, brownish-black concretions; common, medium, brownish-black stains; few fine roots; very strongly acid; gradual, wavy boundary.

IIB'22g—31 to 44 inches +, gray (10YR 6/1) silt loam; common, medium mottles of dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6); moderate, coarse, subangular blocky structure; compact; brittle; few, fine, brownish-black concretions; few, fine, brownish-black stains; few fine roots; very strongly acid.

The A horizon is 4 to 7 inches thick and is dark grayish brown to brown to dark yellowish brown. A thin, yellowish-brown B1 horizon may or may not be present. In the B2 horizon the color may range from dark yellowish brown to yellowish brown or mottled yellowish brown, light brownish gray, and brownish yellow. In places the B2 horizon contains loamy strata. The fragipan is at a depth of 17 to 20 inches. It is commonly mottled gray, yellowish brown, pale brown, or brown and light brownish gray. Its thickness is commonly 6 to 13 inches but may exceed 30 inches. The texture of the horizons beneath the fragipan ranges from heavy loam through silt loam to light clay loam. There are lenses and stratification. The color is gray or light brownish gray, and there may be common to many mottles of yellowish brown, pale brown, and brown.

TICKFAW SERIES.—The soils of the Tickfaw series are acid and poorly drained. They are in broad, flat depressions on ridges in the north-central, central, and south-central parts of the county. The slope is less than 2 percent. These soils developed from thin loess and gray, plastic, fine textured Coastal Plain material. They represent less than 1 percent of the total acreage of the county.

Tickfaw soils are in the same area as Dulac, Bude, Falkner, Wilcox, and Cuthbert soils and are similar to these soils. They differ from Dulac and Bude soils in lacking a fragipan. They are more poorly drained than Wilcox, Falkner, and Cuthbert soils.

Tickfaw soils are low in natural fertility, low in organic-matter content, and low in available water capacity. They have a very shallow root zone. Much of the acreage has been cleared of trees and is now in hay crops and in pasture. Tickfaw soils are less well suited to crops than are other nearby soils, and they are of minor importance to local agriculture.

The following representative profile of Tickfaw silt loam is located in a field about 4 miles west of Cotton Plant on a gravel road and about one half mile south of a dairy, SE¼NW¼ sec. 35, T. 5 S., R. 2 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; common fine roots; common, fine, brownish-black concretions; very strongly acid; abrupt, wavy boundary.

A2—6 to 14 inches, gray (10YR 6/1) silty clay loam; mottles of yellowish brown (10YR 5/6) and dark brown (7.5YR 4/4); moderate, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, empty wormholes or root holes; few brownish-black concretions; very strongly acid; clear, smooth boundary.

B2g—14 to 21 inches, gray (N 6/0) silty clay loam; many, fine and medium, distinct mottles of yellowish brown (10YR 5/6); moderate, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, brownish-black concretions; very strongly acid; clear, smooth boundary.

A'2 and B—21 to 24 inches, gray (10YR 6/1) silty clay loam; common, fine and medium, distinct mottles of dark yellowish brown (10YR 4/4); moderate, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, empty wormholes or root holes; few, fine, brownish-black concretions; very strongly acid; clear, smooth boundary.

IIC1g—24 to 37 inches, gray (10YR 6/1) silty clay; common, fine and medium, faint mottles of yellowish brown (10YR 5/4) and pale brown (10YR 6/3); massive; firm; slightly sticky; slightly plastic; few fine roots; few, fine, brownish-black concretions; common slickensides; very strongly acid; clear, smooth boundary.

IIC2g—37 to 44 inches, gray (10YR 6/1) silty clay; common, fine and medium, distinct mottles of yellowish brown (10YR 5/6); massive; firm; slightly sticky; slightly plastic; few fine roots; few, fine, brownish-black concretions; common slickensides; very strongly acid; clear, smooth boundary.

IIC3g—44 to 60 inches +, mottled yellowish-brown (10YR 5/6) and gray (10YR 6/1) heavy silty clay loam; moderate, fine and medium, angular blocky structure; firm; sticky; plastic; few fine roots; coarse, thick, flat, vertical polygons of gray (10YR 5/1) silty clay; very strongly acid.

The A horizon is 5 to 10 inches thick and is grayish-brown to dark yellowish-brown silt loam. The B horizon is 15 to 20 inches thick and is gray to pale brown silty clay loam mottled with yellowish brown or brown. The C horizon is gray to pale brown in color, is silty clay or clay in texture, and has yellowish-brown mottles.

Azonal order

The azonal order consists of soils that lack distinct, genetically related horizons, commonly because of youth, resistant parent material, or steep topography. The azonal order is represented in this county by the relatively young soils in the Alluvial great soil group.

ALLUVIAL SOILS

Soils of the Alluvial great soil group are developing from transported and recently deposited material. They have been subjected to the dynamic processes of soil formation for a relatively short time. Consequently, there has been little or no modification of the alluvium by the soil forming processes.

The Alluvial great soil group is represented in this county by the Collins and Iuka series.

COLLINS SERIES.—The soils of the Collins series are acid and moderately well drained. They are in narrow and broad stream bottoms in the western two thirds of the county. These soils developed entirely in thick beds of silty alluvium washed from loessal upland soils. They represent almost 1 percent of the total acreage of the county.

Collins soils are in the same area as Falaya and Urbo soils and Mixed alluvial land and are similar to these soils and this land type. They are better drained than Falaya soils. They are also better drained than Urbo soils and are siltier in the C horizon. They are more uniformly silty throughout the profile than Mixed alluvial land.

Collins soils are moderate in natural fertility, low in organic matter content, and moderate to high in available water capacity. They have a moderately deep root zone. Most of the acreage has been cleared of trees and is now in row crops and in pasture. Collins soils are well suited to crops and are important to local agriculture.

The following representative profile of Collins silt loam is located 4 miles west of Cotton Plant and one-fourth mile southwest of a bridge across Hell Creek, on a local road, and about 200 feet south of the roadway, NE¼NE¼ sec. 34, T. 5 S., R. 2 E.

Ap—0 to 6 inches, brown or dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; common fine roots; very strongly acid; clear, smooth boundary.

C1—6 to 13 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine to coarse, subangular blocky structure; very friable; few fine roots; slight traffic pan in upper 3 inches; very strongly acid; clear, smooth boundary.

C2—13 to 19 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; very strongly acid; clear, smooth boundary.

C3—19 to 25 inches, brown or dark brown (10YR 4/3) silt loam; common, fine, faint mottles of light brownish gray (10YR 6/2) and pale brown (10YR 6/3); few, fine, distinct mottles of yellowish red (5YR 5/8); weak, fine and medium, subangular blocky struc-

TABLE 11.—*Physical*

[Soils were sampled in 1961 in Tippah and Pontotoc Counties and were analyzed at the Soil Survey

Soil type, survey and laboratory numbers, and location of samples	Horizon	Depth	Size class and diameter of particles						
			Very coarse sand (2–1 mm.)	Coarse sand (1–0.5 mm.)	Medium sand (0.5–0.25 mm.)	Fine sand (0.25–0.10 mm.)	Very fine sand (0.10–0.05 mm.)	Silt (0.05–0.002 mm.)	Clay (less than 0.002 mm.)
Atwood silt loam: S61 Miss-58-1 (1 to 7); 15186 to 15192.		*In.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct*
On experiment station 7 miles south of Pontotoc on State Highway No. 15 and about ½ mile east on gravel road; SW¼NW¼ sec. 10, T. 11 S., R. 3 E.; Pontotoc County, Miss	Ap	0 to 6	[1] 0.5	3.3	2.0	1.7	1.3	76.0	15.2
	B1	6 to 11	[1] .5	2.3	1.6	1.3	.9	68.7	24.7
	B21t	11 to 23	[1] .6	2.9	1.4	1.2	.8	63.8	29.3
	B22t	23 to 37	[1] .7	3.9	2.2	1.9	1.3	60.3	29.7
	IIB23t	37 to 49	[2] 1.4	6.6	3.2	2.8	1.7	52.4	31.9
	IIB24t	49 to 60	[2] 2.5	8.6	3.7	3.2	1.8	46.1	34.1
	IIB25t	60 to 75	[1] 1.9	8.0	3.6	3.1	1.9	48.3	33.2

ture; friable; few fine roots; very strongly acid; clear, smooth boundary.

C4—25 to 42 inches +, yellowish-brown (10YR 5/4) silt loam; mottled gray (10YR 6/1), dark brown (10YR 4/3), and strong brown (7.5YR 5/6); common, medium, faint mottles of light brownish gray (10YR 6/2); weak, fine and medium, subangular blocky structure; few fine roots; very strongly acid.

The color in the A horizon ranges from brown or dark brown to dark yellowish brown and yellowish brown. In the upper part of the C horizon, the color ranges from strong brown to brown, dark brown, and dark yellowish brown. In the lower part of the C horizon, it is dark brown to yellowish brown, and there may be many mottles of grayish brown, pale brown, or light brownish gray. The depth to mottling is ordinarily about 20 inches but ranges from 18 to 36 inches. The texture in the lower part of the C horizon is loam or heavy silt loam.

IUKA SERIES.—The soils of the Iuka series are acid and moderately well drained. They are on narrow to broad stream bottoms in the eastern one-third of the county. These soils developed from friable Coastal Plain alluvium. They represent less than 1 percent of the total acreage of the county.

Iuka soils are in the same area as Mantachie, Bibb, and Chastain soils and Mixed alluvial land and are similar to these soils and this land type. They are better drained than Mantachie and Bibb soils. They are also better drained than Chastain soils and are sandier throughout the profile. They are more uniformly loamy throughout the profile than Mixed alluvial land.

Iuka soils are moderate in natural fertility, low in organic matter content, and moderate in available water capacity. They have a moderately deep root zone. Most of the acreage has been cleared of trees and is in row crops and in pasture. Iuka soils are very well suited to crops and are important to local agriculture.

The following representative profile of Iuka sandy loam is located in a cottonfield about 5 miles east of Pine Grove, about one-half mile due east of the Concord Baptist Church, and about 100 yards east of the Dry Creek Run Canal, NW¼NE¼ sec. 12, T. 5 S., R. 5 E.

Ap—0 to 8 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; slightly acid; abrupt, smooth boundary.

C1—8 to 15 inches, dark yellowish-brown (10YR 4/4) loam; weak, fine, subangular blocky structure; friable; few fine mica flakes; few fine roots; very strongly acid; gradual, smooth boundary.

C2—15 to 20 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; structureless; friable; few fine mica flakes; few fine roots; very strongly acid; clear, smooth boundary.

C3—20 to 44 inches, yellowish-brown (10YR 5/6) fine sandy loam; common, medium and coarse, distinct mottles of light brownish gray (10YR 6/2); structureless; very friable; common, fine, distinct mottles of strong brown; few fine mica flakes; few fine roots; very strongly acid; clear, smooth boundary.

C4—44 to 55 inches +, mottled gray (10YR 6/1), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/6) fine sandy loam; structureless; friable; few fine roots; few fine mica flakes; very strongly acid.

The A horizon is 6 to 12 inches thick. The color ranges from dark gray to dark yellowish brown, and the texture from sandy loam to loam. The color in the upper part of the C horizon ranges from strong brown to dark yellowish brown, and the texture from loam to sandy loam. The lower part of the C horizon is dark-brown to yellowish brown loam or sandy loam that is commonly mottled with gray below a depth of about 20 inches. The depth to these drainage mottles ranges from 18 to 30 inches.

Laboratory Data

Laboratory data for Atwood, Bude, and Falkner soils are given in tables 11 and 12. These soils were sampled in 1961 in Tippah and Pontotoc Counties, and the samples were analyzed at the Soil Survey Laboratory at Lincoln, Nebr. Table 11 gives physical data, and table 12 chemical data. The information in these tables is useful to soil scientists in classifying soils and in developing concepts of soil genesis, and it is also helpful in estimating available water capacity, fertility, and other properties that affect soil management.

properties of selected soils

Laboratory, Soil Conservation Service, Lincoln, Nebr. Dashes indicate values not determined]

Size class and diameter of particles			Textural class	Bulk density					Moisture held at a tension of—		
International classification		Coarse fragments (more than 2 mm.)		At field moisture content		At 30 centimeters tension		Oven dry	⅓ atmosphere (pieces)	⅓ atmosphere (sieved)	15 atmospheres (sieved)
II (0.2–0.02 mm.)	III (0.02–0.002 mm.)										
Pct.	*Pct.*	*Pct.*		*Pct*	*Gm./cc.*	*Pct*	*Gm./cc.*	*Gm./cc.*	*Pct*	*Pct.*	*Pct*
43.0	35.0	---	Silt loam	16.7	1.45	23.8	1.42	1.46	21.3	24.5	5.7
29.0	41.1	---	Silt loam	---	---	---	---	---	---	---	9.2
27.1	38.0	---	Silty clay loam	19.2	1.57	24.2	1.53	1.64	24.4	29.4	11.1
28.0	34.4	---	Silty clay loam	20.1	1.56	24.9	1.52	1.62	25.1	30.3	10.8
24.7	30.6	---	Silty clay loam	18.3	1.62	21.0	1.58	1.66	20.9	28.0	11.3
20.8	28.5	---	Silty clay loam or clay.	---	---	---	---	---	---	---	12.3
23.1	28.4	---	Silty clay loam	---	---	---	---	---	---	---	12.6

TABLE 11.—*Physical properties*

Soil type, survey and laboratory numbers, and location of samples	Horizon	Depth	Size class and diameter of particles						
			Very coarse sand (2–1 mm.)	Coarse sand (1–0.5 mm.)	Medium sand (0.5–0.25 mm.)	Fine sand (0.25–0.10 mm.)	Very fine sand (0.10–0.05 mm.)	Silt (0.05–0.002 mm.)	Clay (less than 0.002 mm.)
		In.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
Atwood silt loam: S61 Miss-58-2 (1 to 6); 15193 to 15198. About 2½ miles south of Pontotoc on State Highway No. 15 and ¼ mile west on gravel road; SW¼NE¼ sec. 17, T. 10 S., R. 3 E.; Pontotoc County, Miss.	Ap	0 to 6	.3	3.8	3.8	3.5	1.7	70.9	16.0
	B21t	6 to 18	.1	1.9	1.5	1.4	.7	60.5	34.0
	B22t	18 to 31	[1] .2	3.9	3.1	3.1	1.4	57.0	31.3
	IIB23t	31 to 45	[1] .6	5.5	4.1	4.6	2.1	48.1	35.0
	IIB24t	45 to 57	[1] .4	5.3	4.0	4.9	2.2	48.2	35.0
	IIB25t	57 to 79	[1] 1.2	8.2	5.9	8.1	3.5	36.7	36.4
Bude silt loam: S61 Miss-70-3 (1 to 9); 15216 to 15224. About 1½ miles north of Falkner on State Highway No. 15 and 300 feet east of highway; SE¼SW¼ sec. 31, T. 2 S., R. 4 E.; Tippah County, Miss.	Ap	0 to 5	[1] .7	5.5	5.2	8.6	3.6	66.9	9.5
	B21	5 to 13	[1] .8	3.7	3.6	5.9	2.8	64.0	19.2
	B22	13 to 19	[1] 1.0	3.3	3.1	5.3	2.5	63.1	21.7
	B3 & A'2	19 to 23	[2] .7	[2] 3.6	[1] 3.5	[1] 5.9	[1] 2.8	64.5	19.0
	A'2x	23 to 27	[2] 1.2	[2] 3.4	[2] 3.2	[1] 5.7	[1] 2.7	65.9	17.9
	B'21tgx	27 to 29	[2] .7	[1] 2.8	[1] 2.7	[1] 4.1	[1] 2.2	64.3	23.2
	B'22tgx	29 to 44	[2] .7	[1] 4.0	3.4	5.7	2.7	55.0	28.5
	IIB'23tgx	44 to 57	[1] .8	4.3	3.9	6.6	3.2	55.9	25.3
	IIB'3	57 to 63	[1] 1.0	4.6	4.5	7.9	4.0	50.2	27.8
Bude silt loam: S61 Miss-70-4 (1 to 7); 15225 to 15231. About 2½ miles southwest of Falkner and about 250 feet north of gravel road; SE¼SW¼ sec. 10, T. 3 S., R. 3 E.; Tippah County, Miss.	Ap	0 to 7	[1] 1.2	[1] 3.8	4.7	11.1	4.4	64.2	10.6
	B21	7 to 12	[1] .5	[1] 2.3	2.7	7.0	3.0	65.1	19.4
	B22	12 to 20	[1] .6	[1] 2.3	2.8	6.8	2.6	64.5	20.4
	A'2 & B3	20 to 24	[2] .4	[2] 2.2	[1] 2.8	[1] 6.9	[1] 2.5	63.5	21.7
	A'2x	24 to 28	[2] .4	[2] 1.8	[1] 2.3	[1] 5.5	[1] 2.2	57.9	29.9
	B'21tgx	28 to 46	[2] .6	[1] 2.3	[1] 2.8	6.6	2.7	52.3	32.7
	IIB'22tg	46 to 62	.6	3.5	4.7	12.2	4.7	48.3	26.0
Falkner silt loam: S61 Miss-70-1 (1 to 9); 15199 to 15207. About 2½ miles south of Blue Mountain on State Highway No. 15 and about 1,000 feet east of highway; NE¼NE¼ sec. 19, T. 5 S., R. 3 E.; Tippah County, Miss.	A1	0 to ½	[3] .2	1.0	.6	1.1	1.8	78.4	16.9
	A2	½ to 5	[4] .4	[4] .7	[4] .4	[4] .6	[2] 1.4	82.5	14.0
	B21	5 to 14	[4] .4	[4] .8	[4] .4	[4] .6	[2] .8	67.6	29.4
	B22	14 to 18	[4] .5	[4] .8	[4] .4	[4] .5	[4] .8	66.1	30.9
	B23g	18 to 24	[4] .4	[4] .9	[4] .4	[4] .5	[4] 1.0	67.7	29.1
	IIB24g	24 to 26	[4] .2	[4] .6	[4] .4	[4] .5	[4] 1.0	54.2	43.1
	IIC1g	26 to 33	[4] .1	[4] .5	[4] .3	[4] .5	[4] 1.0	55.1	42.5
	IIC2g	33 to 44	[2] 1.0	[2] .7	[2] .4	[2] .7	[2] 2.0	48.4	46.8
	IIC3g	44 to 60	[5] .1	[5] .6	[5] .7	[5] 1.5	2.8	34.9	59.4
Falkner silt loam: S61 Miss-70-2 (1 to 8); 15208 to 15215. About 3 miles east of Blue Mountain and 300 feet south of local road; SW¼SW¼ sec. 10, T. 5 S., R. 3 E.; Tippah County, Miss.	A1	0 to ½	[2,6] .7	[2,6] 2.2	[2,5] 1.6	2.4	1.8	77.7	13.6
	A2	½ to 6	[4] 1.1	[4] 1.5	[2] 1.2	[2] 1.4	[2] 1.1	76.2	17.5
	B21	6 to 12	[4] .2	[4] .9	[4] .9	[2] .9	[2] .9	66.5	29.7
	B22	12 to 18	[4] .7	[4] 1.5	[4] .9	[2] 1.1	[2] 1.0	70.0	24.8
	B23g	18 to 23	[4] .1	[4] .5	[2] .6	[2] .8	[2] 1.0	63.5	33.5
	IIB24t	23 to 28	[4] .1	[4] .4	[2] .5	[1] .7	[1] .8	50.9	46.6
	IIC1g	28 to 41	[4] .2	[2] .5	[2] .6	[1] .7	[1] .8	51.9	45.3
	IIC2g	41 to 61	[2] .2	[2] .6	[2] .8	[1] 1.0	[1] 1.2	57.1	39.1

[1] Few aggregates, probably ferromanganese.
[2] Common aggregates, probably ferromanganese.
[3] Many organic-matter fragments.
[4] Many aggregates, probably ferromanganese.

of selected soils—Continued

Size class and diameter of particles—Continued: International classification II (0.2–0.02 mm.)	International classification III (0.02–0.002 mm.)	Coarse fragments (more than 2 mm.)	Textural class	Bulk density: At field moisture content		Bulk density: At 30 centimeters tension		Bulk density: Oven dry	Moisture held at a tension of: ⅓ atmosphere (pieces)	⅓ atmosphere (sieved)	15 atmospheres (sieved)
Pct.	*Pct.*	*Pct.*		*Pct.*	*Gm./cc.*	*Pct.*	*Gm./cc.*	*Gm./cc.*	*Pct.*	*Pct.*	*Pct.*
40.4	33.4		Silt loam	13.7	1.60	21.1	1.56	1.63	19.4	22.9	6.0
26.2	35.5		Silty clay loam								13.8
27.2	32.3		Silty clay loam	17.6	1.58	24.7	1.52	1.64	24.7	30.2	12.4
24.6	27.3		Silty clay loam								13.7
27.1	25.2		Silty clay loam	16.0	1.64	21.3	1.58	1.70	20.1	27.3	13.4
22.0	21.5		Clay loam								14.2
43.5	31.3		Silt loam	28.1	1.41	28.4	1.40	1.45	24.1	29.0	6.0
34.2	35.6		Silt loam								7.8
33.4	34.9		Silt loam	20.9	1.50	25.0	1.46	1.54	20.9	27.3	8.8
32.4	37.9		Silt loam								8.6
33.6	37.9		Silt loam								8.2
31.9	36.6		Silt loam								10.0
30.4	30.2		Silty clay loam	18.6	1.70	23.1	1.60	1.76	18.6	29.8	12.6
29.7	32.8		Silt loam	16.6	1.75	21.8	1.64	1.79	18.8	28.8	11.8
29.1	29.2		Silty clay loam								11.9
42.3	32.1		Silt loam	18.6	1.62	21.9	1.59	1.63	22.5	24.7	4.6
35.5	36.3		Silt loam								7.3
33.4	37.1		Silt loam	20.3	1.56	23.4	1.52	1.60	22.1	26.3	8.3
31.9	37.4		Silt loam								8.4
28.8	33.9		Silty clay loam								11.9
27.5	30.8		Silty clay loam	18.1	1.68	21.3	1.60	1.80	26.1	31.0	14.0
30.4	28.8		Loam								11.0
38.5	42.2		Silt loam								14.8
42.6	41.6		Silt loam								6.5
31.5	37.2		Silty clay loam	25.3	1.40	29.1	1.38	1.48	24.2	31.7	12.3
29.3	37.9		Silty clay loam								13.5
30.6	38.4		Silty clay loam								13.0
26.0	29.5		Silty clay								18.8
25.9	30.5		Silty clay								19.0
25.8	25.0		Silty clay	28.1	1.42	32.7	1.32	1.88	36.1	44.8	22.8
9.4	29.1	35	Clay								49.6
36.3	44.3		Silt loam								14.3
35.8	42.1		Silt loam								7.9
29.7	38.1		Silty clay loam	24.3	1.38	30.8	1.34	1.42	26.6	34.5	12.5
31.4	40.1		Silt loam								10.5
28.0	36.9		Silty clay loam								14.3
22.2	29.8		Silty clay								20.5
24.4	28.6		Silty clay	26.7	1.46	30.8	1.36	1.88	30.8	41.2	20.6
26.0	32.8		Silty clay loam								19.3

[5] Common sandstone and shale fragments.

[6] Common organic matter fragments.

TABLE 12.—*Chemical*

[Soils were sampled in 1961 in Tippah and Pontotoc Counties and were analyzed at the Soil Survey

Soil type, survey and laboratory numbers, and location of samples	Horizon	Depth	pH at 1:1 suspension		Organic matter		
			H_2O	KCl	Organic carbon	Nitrogen	C/N
Atwood silt loam: S61 Miss–58-1(1 to 7); 15186 to 15192.		*In.*			*Pct.*	*Pct.*	
On experiment station 7 miles south of Pontotoc on State Highway No. 15 and about ½ mile east on gravel road; SW¼NW¼ sec 10, T. 11 S., R. 3 E.; Pontotoc County, Miss.	Ap	0 to 6	6.8	6.0	0.72	0.072	10
	B1	6 to 11	6.0	5.2	.32	.055	6
	B21t	11 to 23	5.7	4.8	.17	.046	4
	B22t	23 to 37	4.7	3.7	.08	.041	2
	IIB23t	37 to 49	4.8	3.7	.11		
	IIB24t	49 to 60	4.8	3.7	.11		
	IIB25t	60 to 75	4.7	3.8	.09		
Atwood silt loam: S61 Miss–58-2 (1 to 6); 15193 to 15198.							
About 2½ miles south of Pontotoc on State Highway No 15 and ¼ mile west on gravel road; SW¼NE¼ sec. 17, T. 10 S., R. 3 E.; Pontotoc County. Miss.	Ap	0 to 6	6.6	6.0	.53	.061	9
	B21t	6 to 18	6.5	5.3	.18	.046	4
	B22t	18 to 31	6.3	5.3	.10	.043	2
	IIB23t	31 to 45	6.3	5.4	.07		
	IIB24t	45 to 57	4.9	3.8	.06		
	IIB25t	57 to 79	6.3	5.3	.06		
Bude silt loam: S61 Miss–70-3 (1 to 9); 15216 to 15224.							
About 1½ miles north of Falkner on State Highway No. 15 and 300 feet east of highway; SE¼SW¼ sec. 31, T. 2 S., R. 4 E.; Tippah County, Miss.	Ap	0 to 5	5.6	4.9	1.69	.131	13
	B21	5 to 13	4.8	3.7	.30	.037	8
	B22	13 to 19	4.6	3.4	.14	.026	5
	B3 and A'2	19 to 23	4.8	3.3	.10	.023	4
	A'2x	23 to 27	4.6	3.1	.05	.016	3
	B'21tgx	27 to 29	4.7	2.8	.04		
	B'22tgx	29 to 44	4.4	2.6	.04		
	IIB'23tgx	44 to 57	4.7	2.6	.02		
	IIB'3	57 to 63	4.8	3.1	.02		
Bude silt loam: S61 Miss 70-4 (1 to 7); 15225 to 15231.							
About 2½ miles southwest of Falkner and about 250 feet north of gravel road; SE¼SW¼ sec. 10, T. 3 S., R. 3 E.; Tippah County, Miss.	Ap	0 to 7	5.5	4.3	.91	.076	12
	B21	7 to 12	5.0	3.5	.30	.039	8
	B22	12 to 20	4.8	3.3	.13	.022	6
	A'2 and B3	20 to 24	5.2	3.2	.09	.019	5
	A'2x	24 to 28	5.0	3.1	.10	.020	5
	B'21tgx	28 to 46	4.7	3.0	.06		
	IIB'22tgx	46 to 62	5.0	3.2	.02		
Falkner silt loam: S61 Miss–70-1 (1 to 9); 15199 to 15207.							
About 2½ miles south of Blue Mountain on State Highway No. 15 and about 1,000 feet east of highway; NE¼NE¼ sec. 19, T. 5 S., R. 3 E.; Tippah County, Miss.	A1	0 to ½	5.8	4.9	8.26	.478	17
	A2	½ to 5	4.7	3.7	1.38	.121	11
	B21	5 to 14	4.7	3.3	.34	.056	6
	B22	14 to 18	4.7	2.8	.24	.047	5
	B23g	18 to 24	4.8	2.8	.17	.034	5
	IIB24g	24 to 26	4.6	2.6	.17	.036	5
	IIC1g	26 to 33	4.4	2.5	.12		
	IIC2g	33 to 44	3.9	2.7	.07		
	IIC3g	44 to 60	4.0	2.8	.10		
Falkner silt loam: S61 Miss–70-2 (1 to 8); 15208 to 15215.							
About 3 miles east of Blue Mountain and 300 feet south of local road; SW¼SW¼ sec. 10. T. 5 S., R. 3 E.; Tippah County, Miss.	A1	0 to ½	5.2	4.7	8.69	.380	23
	A2	½ to 6	4.9	4.0	1.47	.102	14
	B21	6 to 12	4.8	3.4	.33	.032	10
	B22	12 to 18	4.5	3.5	.20	.030	7
	B23g	18 to 23	4.6	3.1	.14	.025	6
	IIB24t	23 to 28	4.2	2.9	.12	.027	4
	IIC1g	28 to 41	4.0	2.8	.10		
	IIC2g	41 to 61	3.9	2.8	.09		

properties of selected soils

Laboratory, Soil Conservation Service, Lincoln, Nebr. Dashes indicate values not determined]

Cation exchange capacity (by NH_4OAc)	Extractable cations (milliequivalents per 100 grams of soil): Extractable bases: Ca	Mg	Na	K	H	Base saturation (by NH_4OAc)	Sum of extractable bases and H	Base saturation on sum of bases and H	Ca/Mg	Free iron (Fe_2O_3)
						Pct.		Pct.		Pct.
6. 3	6. 0	0. 8	<0. 1	0. 2	3. 2	111	10. 2	69	7. 5	1. 5
7. 7	5. 1	1. 4	. 1	. 2	4. 7	88	11. 5	59	3. 6	2. 1
10. 6	4. 8	3. 0	. 1	. 2	5. 4	76	13. 5	60	1. 6	2. 7
8. 8	1. 2	2. 3	. 1	. 2	10. 0	43	13. 8	28	. 5	3. 0
8. 9	. 6	1. 9	. 1	. 2	10. 5	31	13. 3	21	. 3	2. 8
9. 0	. 6	2. 2	. 1	. 2	9. 4	34	12. 5	25	. 3	3. 2
9. 4	. 8	2. 4	. 1	. 2	8. 4	37	11. 9	29	3	2. 9
7. 0	6. 2	. 8	<. 1	. 3	2. 8	104	10. 1	72	7. 8	1. 9
13. 4	10. 0	1. 2	. 1	. 3	6. 1	86	17. 7	66	8. 3	3. 4
10. 7	7. 8	1. 6	. 1	. 4	4. 7	92	14. 6	68	4. 9	3. 4
10. 1	6. 1	2. 3	<. 1	. 6	4. 4	89	13. 4	67	2. 6	3. 5
9. 4	3. 4	2. 4	<. 1	5	7. 0	67	13. 3	47	1. 4	3. 6
10. 0	3. 7	3. 9	<. 1	. 6	4. 4	82	12. 6	65	. 9	4. 1
6. 6	3. 4	. 5	. 1	. 1	6. 2	62	10. 3	40	6. 8	1. 1
7. 2	. 9	. 6	. 1	. 1	8. 6	24	10. 3	16	1. 5	1. 8
8. 4	1. 0	. 6	. 1	. 1	9. 8	21	11. 6	16	1. 7	2. 2
8. 5	. 7	. 6	. 1	. 1	9. 5	18	11. 0	14	1. 2	2. 7
7. 8	. 8	. 9	. 2	. 1	8. 8	26	10. 8	18	. 9	2. 6
11. 1	1. 4	1. 9	. 3	. 2	10. 8	34	14. 6	26	. 7	2. 0
14. 3	2. 4	2. 9	. 4	. 2	12. 6	41	18. 5	32	. 8	1. 9
12. 9	2. 8	3. 3	. 4	. 2	10. 5	52	17. 2	39	. 8	1. 8
13. 3	3. 6	3. 6	. 4	. 2	9. 4	59	17. 2	45	1. 0	2. 3
5. 6	2. 1	. 7	<. 1	. 6	5. 3	61	8. 7	39	3. 0	1. 0
7. 2	2. 4	. 8	. 1	. 1	6. 7	47	10. 1	34	3. 0	1. 3
7. 8	1. 4	. 9	. 1	. 1	7. 9	32	10. 4	24	1. 6	1. 7
8. 7	1. 0	1. 2	. 2	. 1	9. 3	29	11. 8	21	. 8	2. 2
13. 9	1. 4	2. 3	. 3	. 2	13. 6	30	17. 8	24	. 6	2. 3
17. 3	2. 4	4. 1	. 5	. 2	14. 3	42	21. 5	33	. 6	2. 0
12. 1	2. 6	4. 1	. 5	. 2	8. 2	61	15. 6	47	. 6	1. 0
24. 9	15. 5	4. 1	. 1	. 6	18. 5	82	38. 8	52	3. 8	1. 3
8. 9	. 8	1. 4	<. 1	. 2	11. 6	27	14. 0	17	. 6	1. 6
13. 1	. 8	1. 6	. 1	. 2	15. 5	21	18. 2	15	. 5	2. 9
15. 7	1. 1	2. 3	. 2	. 2	17. 7	24	21. 5	18	. 5	3. 3
16. 3	1. 8	2. 8	. 2	. 2	16. 5	31	21. 5	23	. 6	3. 1
28. 0	4. 5	6. 3	. 4	. 4	22. 3	41	33. 9	34	. 7	1. 7
28. 5	5. 5	7. 0	. 6	. 4	21. 3	47	34. 8	39	. 8	1. 8
34. 4	8. 2	10. 0	. 7	. 4	22. 5	56	41. 8	46	. 8	2. 3
47. 4	13. 9	15. 5	1. 3	. 5	28. 4	66	59. 6	52	. 9	2. 4
21. 0	10. 1	2. 6	<. 1	. 5	20. 5	63	33. 7	39	3. 9	1. 1
9. 8	. 3	1. 0	<. 1	. 2	13. 5	15	15. 0	10	. 3	1. 7
15. 4	. 1	2. 5	. 2	. 2	17. 0	19	20. 0	15	------	2. 0
12. 6	. 1	1. 9	. 1	. 1	14. 5	17	16. 7	13	------	2. 6
19. 3	1. 1	4. 0	. 2	. 2	19. 0	28	24. 5	22	. 3	2. 5
30. 0	2. 8	8. 5	. 5	. 4	25. 0	41	37. 2	33	. 3	1. 8
29. 6	3. 4	9. 3	. 6	. 3	24. 1	46	37. 7	36	. 4	1. 5
27. 4	4. 7	11. 7	1. 0	. 3	16. 6	64	34. 3	52	. 4	1. 4

Methods of Sampling and Analysis

Six samples were collected from pits at different locations. The samples were air dried, rolled, and crushed, and a suitable subsample was passed through a 2-millimeter, square holed sieve. The results are reported on an oven-dry basis.

Standard methods of the Soil Survey Laboratory were used to obtain the data. Determinations of clay were made by the pipette method (*7, 8, 9*). Bulk density measurements were made on clods at three different moisture levels: at field moisture (the moisture content of the clods as received in the laboratory); at 30 centimeters tension (the adsorbed moisture content of clods subjected to 30 centimeters water tension on a sand capillary column); and, finally, at oven dryness. The volume was measured by displacement in water; the oven-dry weight was used to calculate the bulk density.[6] Moisture tension measurements were made on soil pieces and sieved samples by pressure plate and pressure membrane apparatus (*15, 18*).

Reaction was measured with a glass electrode in 1:1 soil-water and KCl suspensions. Organic carbon was determined by wet combustion, using a modification of the Walkley Black method (*10*). Total nitrogen was determined by the AOAC modified procedure (*2*). The cation exchange capacity was determined by direct distillation of adsorbed ammonia (*10*). To determine the extractable calcium and magnesium, calcium was separated as calcium oxalate and magnesium as magnesium ammonium phosphate. Extractable sodium and potassium were determined on original ammonium acetate extracts using the Beckman DU flame spectrophotometer. The triethanolamine method was used to determine extractable hydrogen. Free iron oxide was determined by extraction with sodium hydrosulfite and titration with standard potassium dichromate (*6*).

Laboratory Interpretations

Atwood, Bude, and Falkner soils formed in a thin mantle of silty loess over older Coastal Plain sediments. The particle-size distribution and the mineralogy bear this out. All of the samples analyzed were high in silt and low in sand in the upper part of the solum, and all have lithologic discontinuities. In Atwood soils the lower part of the solum is clay loam or silty clay loam. In Bude soils it ranges from loam to silty clay loam, and in Falkner soils it is silty clay. A study of the mineralogy indicates that the upper part of the solum in each of these soils contains a higher proportion of feldspar to quartz and greater amounts of pyroxene than does the lower part. This fact suggests less weathering in the loessal material than in the Coastal Plain sediments.

Bude and Falkner soils are strongly acid to very strongly acid. Atwood soils are medium acid to slightly acid in the upper part of the solum. Falkner soils have a higher organic-carbon content and carbon nitrogen ratio in the A horizon than do Bude and Atwood soils, probably because they are in hardwood timber. Bude and Atwood soils have been farmed intensively and have a low carbon-nitrogen ratio.

[6] BRASHER, B. R., DAVIDSON, S. E., and VALASSIS, V. VOLUME MEASUREMENT AND BULK DENSITY OF SARAN COATED SOIL FRAGMENTS. Soil Sci. Soc. Am. Proc. [In press.]

The cation-exchange capacity is high in Falkner soils, ranging from 8.9 to 47.4 milliequivalents per 100 grams of soil, and the percentage of base saturation increases with depth. In Bude soils it is from 5.6 to about 17 milliequivalents, and the percentage of base saturation increases with depth. The cation-exchange capacity in Atwood soils ranges from 6.3 to 13.4 milliequivalents per 100 grams of soil. Base saturation in the IIB25t horizon ranges from 29 percent to 65 percent.

The ratio of calcium to magnesium is considerably higher in Atwood soils than in Bude and Falkner soils. The available moisture capacity of these soils varies with the texture. The silt loam A horizons have about 0.22 inch of available moisture per inch of soil. The silty clay loam B horizons contain about 0.20 inch per inch of soil. The silty clay C horizon in Falkner soils has about 0.18 inch per inch of soil.

Descriptions of Profiles Sampled

Atwood silt loam.—Profile located on experiment station 7 miles south of Pontotoc on State Highway No. 15 and about one-half mile east on gravel road; SW¼NW¼ sec. 10, T. 11 S., R. 3 E., Pontotoc County, Miss.; vegetation is alfalfa hay. *Survey No.* S61 Miss 58–1 (1 to 7). *Laboratory Nos.* 15186 to 15192.

Ap—0 to 6 inches, dark-brown to brown (7.5YR 3/2–4/4) silt loam; weak, fine and medium, granular structure; friable; common fine roots; few worm casts; clear, smooth boundary.

B1—6 to 11 inches, dark reddish-brown (5YR 3/4) heavy silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; few worm casts; some mixing of material in root and worm holes; clear, smooth boundary.

B21t—11 to 23 inches, dark reddish-brown (5YR 3/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, black concretions and fine and medium coatings; gradual, smooth boundary.

B22t—23 to 37 inches, dark reddish-brown (5YR 3/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; friable; slightly plastic to plastic; few fine roots; common, fine to coarse, black coatings and common, fine, black concretions; patchy clay films on peds and in cracks; gradual, smooth boundary.

IIB23t—37 to 49 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; friable; slightly plastic to plastic; few fine roots; many, fine to coarse, black coatings and many, fine, black concretions; clay films on ped faces and in cracks; gradual, smooth boundary.

IIB24t—49 to 60 inches, same as horizon above; horizon divided for characterization.

IIB25t—60 to 75 inches, dark-red (10R 3/6) clay loam; moderate, coarse and medium, subangular blocky structure; friable; slightly plastic; few, fine, black concretions and coatings; patchy clay films on ped faces and in cracks.

The colors in the foregoing description are for moist soil.
Slope and relief: Nearly level (2 percent slopes).
Drainage: Well drained; runoff medium or rapid; internal drainage medium.
Permeability: Moderate.
Parent material: Thin loess over Coastal Plain sediments.

Atwood silt loam.—Profile located 2½ miles south of Pontotoc on State Highway No. 15 and one fourth mile west on gravel road; SW¼NE¼ sec. 17, T. 10 S., R. 3 E.,

Pontotoc County, Miss.; vegetation is alfalfa hay. *Survey No.* S61 Miss–58–2 (1 to 6). *Laboratory Nos.* 15193 to 15198.

Ap—0 to 6 inches, dark-brown to brown (7.5YR 3/2–4/4) silt loam; weak, fine and medium, granular structure; friable; common fine roots; few worm casts; some mixing of material from B horizon in wormholes and root channels; abrupt, smooth boundary.

B21t—6 to 18 inches, dark reddish-brown (5YR 3/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, black concretions; few old root channels filled with material from Ap horizon; patchy clay films on peds and in root channels; gradual, smooth boundary.

B22t—18 to 31 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, medium and coarse, subangular and angular blocky structure; friable; slightly plastic to plastic; few fine roots; many, fine to coarse, black coatings and many, fine, black concretions; clay films on peds and in cracks; few old root channels and wormholes filled with material from Ap horizon; gradual, smooth boundary.

IIB23t—31 to 45 inches, dark reddish brown (2.5YR 3/4) silty clay loam; moderate, medium and coarse, subangular and angular blocky structure; friable; slightly plastic to plastic; few fine roots; common, fine to coarse, black coatings and common, fine, black concretions; clay films on ped faces and in cracks; few root channels filled with material from horizon above; gradual, smooth boundary.

IIB24t—45 to 57 inches, same as horizon above; horizon divided for characterization.

IIB25t 57 to 79 inches, dark-red (10R 3/6) clay loam; moderate, medium and coarse, subangular and angular blocky structure; friable; slightly plastic; few, fine, black coatings and concretions; patchy clay films on ped faces and in cracks.

The colors in the foregoing description are for moist soil.
Slope and relief: Nearly level (2 percent slopes).
Drainage: Well drained; runoff medium or rapid; internal drainage medium.
Permeability: Moderate.
Parent material: Thin loess over Coastal Plain sediments.

Bude silt loam.—Profile located about 1½ miles north of Falkner on State Highway No. 15 and 300 feet east of highway; SE¼SW¼ sec. 31, T. 2 S., R. 4 E.; Tippah County, Miss.; vegetation is bermudagrass pasture. *Survey No.* S61 Miss–70–3 (1 to 9). *Laboratory Nos.* 15216 to 15224.

Ap—0 to 5 inches, mottled brown to dark-brown (10YR 4/3), pale-brown (10YR 6/3), and dark grayish-brown (10YR 4/2) silt loam; mottles are many, fine, faint; weak, fine and medium, granular structure; friable; common fine roots; few, fine, black and brown concretions; brown stains around roots; few wormholes and root channels filled with material from B horizon; clear, smooth boundary.

B21 5 to 13 inches, yellowish-brown (10YR 5/6) silt loam; weak, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, soft, brown and black concretions; few root channels and wormholes filled with material from Ap horizon; clear, smooth boundary.

B22—13 to 19 inches, mottled yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), pale-brown (10YR 6/3), and light yellowish-brown (10YR 6/4) heavy silt loam; mottles are many, fine, faint and distinct; weak, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, soft, brown and black concretions; clear, smooth boundary.

B3 and A'2 19 to 23 inches, mottled yellowish-brown (10YR 5/6), light yellowish-brown (2.5Y 6/4), and light brownish-gray (2.5Y 6/2) silt loam; mottles are many, fine, faint and distinct; weak, fine and medium, subangular blocky structure; friable; few fine roots; common, fine, brown and black concretions; common, medium, black coatings; common fine voids; clear, smooth boundary.

A'2x—23 to 27 inches, mottled light olive-brown (2.5Y 5/4), light brownish-gray (2.5Y 6/2), and light yellowish-brown (2.5Y 6/4) silt loam; mottles are many, fine, faint and distinct; weak, fine and medium, subangular blocky structure; friable; few fine roots; many, fine, brown and black concretions; many fine voids; clear, smooth boundary.

B'21tgx 27 to 29 inches, mottled light-gray to gray (5Y 6/1), yellowish-brown (10YR 5/6), and light-gray (10YR 7/1) heavy silt loam; mottles are many, fine, faint and distinct; moderate, fine and medium, subangular blocky structure; friable; few fine roots; many, fine, brown and black concretions; many fine voids; peds covered with gray silt (10YR 7/1); clear, smooth boundary.

B'22tgx—29 to 44 inches, gray (5Y 5/1) silty clay loam; many, fine, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium and coarse, angular and subangular blocky structure; friable to firm; plastic; few fine roots; common, fine, soft, brown and black concretions; patchy clay films in root channels and cracks; common vertical cracks up to 2 inches wide filled with gray (5Y 5/1) heavy silty clay loam; gray (10YR 7/1) silt coatings on ped faces; gradual, smooth boundary.

IIB'23tgx—44 to 57 inches, mottled yellowish-brown (10YR 5/6), light olive-brown (2.5Y 5/4), and gray (10YR 5/1) silt loam; mottles are many, fine to coarse, and distinct; moderate, coarse, angular blocky structure; friable to firm; slightly plastic; few fine roots; common, fine, soft, brown and black concretions; patchy clay films in cracks; common vertical cracks less than 1 inch wide filled with gray (5Y 5/1) heavy silty clay loam; gradual, smooth boundary.

IIB3—57 to 63 inches, mottled yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and gray (10YR 5/1) silty clay loam; mottles are many, fine to coarse, faint and distinct; weak to moderate, coarse, angular blocky structure; friable to firm; slightly plastic; common, fine, brown and black concretions; few cracks filled with gray (5Y 5/1) material.

The colors in the foregoing description are for moist soil.
Slope and relief: Nearly level (1 percent slopes).
Drainage: Somewhat poorly drained; runoff slow or medium; internal drainage slow.
Permeability: Moderate in upper part of solum; slow in lower part.
Parent material: Thin loess over Coastal Plain sediments.

Bude silt loam.—Profile located about 2½ miles southwest of Falkner and about 250 feet north of gravel road; SE¼SW¼ sec. 10, T. 3 S., R. 3 E.; Tippah County, Miss.; vegetation is bermudagrass pasture. *Survey No.* S61 Miss–70–4 (1 to 7). *Laboratory Nos.* 15225 to 15231.

A detailed description of this profile is given on p. 82 under the heading "Bude Series."

The colors in this description are for moist soil.
Slope and relief: Nearly level (1 percent slopes).
Drainage: Somewhat poorly drained; runoff slow or medium; internal drainage slow.
Permeability: Moderate in upper part of solum; slow in lower part.
Parent material: Thin loess over Coastal Plain sediments.

Falkner silt loam.—Profile located about 2½ miles south of Blue Mountain on State Highway No. 15 and about 1,000 feet east of highway; NE¼NE¼ sec. 19, T. 5 S., R. 3 E.; Tippah County, Miss.; vegetation is

hardwood forest. *Survey No.* S61–Miss–70–1 (1 to 9). *Laboratory Nos.* 15199 to 15207.

O1—½ inch to 0, oak leaves.

A1—0 to ½ inch, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; friable; common, fine and medium roots; abrupt, wavy boundary.

A2—½ inch to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, granular structure; friable; common, fine and medium roots; few, fine, manganese concretions; root channels and worm holes filled with material from A1; clear, smooth boundary.

B21—5 to 14 inches, yellowish-brown (10YR 5/6) light silty clay loam; moderate, fine and medium, subangular blocky structure; friable; slightly plastic; few fine roots; few, fine, black concretions; clear, smooth boundary.

B22 14 to 18 inches, yellowish-brown (10YR 5/4) silty clay loam; many, fine, faint and distinct mottles of light gray to gray (10YR 6/1) and brown to dark brown (7.5YR 4/4); moderate, fine, subangular blocky structure; plastic; friable; few, fine and medium roots; clear, smooth boundary.

B23g—18 to 24 inches, mottled light-gray to gray (10YR 6/1), yellowish brown (10YR 5/4), and brown to dark-brown (7.5YR 4/4), silty clay loam; mottles are many, fine, faint and distinct; moderate, fine, subangular blocky structure; friable; plastic; few fine roots; few, fine, soft, black concretions; clear, smooth boundary.

IIB24g—24 to 26 inches, gray (10YR 5/1) heavy silty clay loam; many, fine, distinct mottles of yellowish brown (10YR 5/4); moderate, very fine and fine, subangular blocky structure; friable; plastic; few fine roots; common, fine, soft, brown concretions; light gray (10YR 7/1) silt coatings on ped faces; abrupt, smooth boundary.

IIC1g—26 to 33 inches, gray (10YR 5/1) clay; many, fine, distinct mottles of yellowish brown (10YR 5/4); massive; very plastic; sticky; few, medium and fine roots; few, fine iron concretions; gradual, smooth boundary.

IIC2g—33 to 44 inches, grayish-brown (2.5Y 5/2) clay; few, fine, distinct mottles of yellowish brown (10YR 5/4); massive; very plastic; sticky; common, fine and medium and few, coarse, hard iron concretions; clear, wavy boundary.

IIC3g—44 to 60 inches, light brownish-gray (2.5Y 6/2) clay shale mottled with grayish brown (2.5Y 5/2); breaks to fine to coarse angular blocks up to 3 inches in diameter; some blocks are coated with strong-brown (7.5YR 5/6) iron stains.

The colors in the foregoing description are for moist soil.
Slope and relief: Nearly level (1 percent slopes).
Drainage: Somewhat poorly drained; runoff slow or medium; internal drainage slow.
Permeability: Moderate in upper part of solum; very slow in C horizon.
Parent material: Thin loess over clay.

Falkner silt loam.—Profile located about 3 miles east of Blue Mountain and 300 feet south of local road; SW¼SW¼ sec. 10, T. 5 S., R. 3 E.: Tippah County, Miss.; vegetation is hardwood forest. *Survey No.* S61 Miss 70–2 (1 to 8). *Laboratory Nos.* 15208 to 15215.

A detailed description of this profile is given on p. 76 under the heading "Falkner Series."

The colors in this description are for moist soil.
Slope and relief: Nearly level (1 percent slopes).
Drainage: Somewhat poorly drained; runoff slow or medium; internal drainage slow.
Permeability: Moderate in upper part of solum; very slow in D horizon.
Parent material: Thin loess over Coastal Plain clay.

Additional Facts About the County

Tippah County is one of the Chickasaw secession counties of north Mississippi. The Chickasaw Indian nation ceded all of the territory that is now within the State of Mississippi to the United States, under terms of the Treaty of Pontotoc Creek, on October 20, 1832.

The Mississippi Legislature created the county early in 1836, and land was made available for purchase and settlement. The original settlers came mostly from Tennessee, although many immigrated from Georgia, Alabama, and the Carolinas. Scotch-Irish and German strains predominated.

The original area of the county was 995 square miles. In 1870 the boundary lines were adjusted, and the area was reduced to 464 square miles. No boundary changes have been made since 1870.

The 1960 population of the county was 15,093, a reduction of about 24 percent since 1940. Ripley is the county seat.

Natural Resources

About 54 inches of rain falls in this county each year. Hundreds of artificial ponds and small lakes throughout the county provide enough water for livestock and recreation and a limited amount for irrigation of row crops. Drinking water and industrial water are obtained from deep wells, artesian wells, shallow wells, and springs.

In 1957, about 162,000 acres in the county was woodland, and 105.9 million board feet of timber was available. Of this, 27.4 million board feet was pine, 23.6 was soft hardwood, 42.1 was oak, and 12.8 was hard hardwood (*12*). In addition, there was 112,600 cords of softwood and 261,300 cords of hardwood, making a total of 292.8 million board feet in the county. The potential growth rate, if the forests are well managed and protected from fire, is more than 300 board feet per acre per year.

Almost unlimited amounts of Porters Creek clay are available in Tippah county. A bed about 200 feet thick is at the surface along a north south belt through the center of the county. There are two commercial mines at which this material is dug and processed for shipment to distant markets. No other minerals are commercially produced at the present time.

Geology

Rocks of eight geologic formations are exposed in Tippah County. From oldest to youngest, these formations are the Ripley, Owl Creek, Clayton, Porters Creek, Betheden, Fearn Springs, Ackerman, and Meridian. The Ripley and Owl Creek formations were deposited during the Cretaceous period. The Clayton and Porters Creek formations were deposited and the Betheden residuum developed during the Paleocene epoch of the Cenozoic era. The Fearn Springs, Ackerman, and Meridian formations were deposited during the Eocene epoch of the Cenozoic era.

The regional dip is to the west at 15 to 30 feet per mile. The strike is north. Ordinarily these conditions would produce an outcrop pattern in which the oldest formation would be exposed at the eastern boundary of the county and successively younger formations to the

west. Such an orderly arrangement, however, is complicated by the topography and by variations in the thickness of the formations.

The Ripley, Clayton, Porters Creek, and Ackerman formations form the surface of most of the county. The Ripley outcrop forms the surface of roughly the eastern quarter of the county, and the Ackerman that of most of the western quarter. The Clayton and Porters Creek formations form the surface of the midsection of the county; the Clayton is east of Mississippi State Highway No. 15 and the Porters Creek is on the west, except at Blue Mountain where it extends more than 3 miles east of State Highway No. 15. Irregular and scattered outcrops of the Owl Creek formation occur between the Porters Creek and the Ackerman. The Meridian formation is at the top of the higher hills in the western part of the county.

The Ripley formation can be divided into four units. The basal unit is a transitional clay. This calcareous, gray sandy clay forms a transition zone between the sandy Ripley material and the underlying Selma chalk. The second unit is known as the Coon Creek tongue. Its chief components are sandy clays and marls, which are bluish black in color, are laminated and micaceous, and contain partings of fine sand. The third unit is known as the McNairy sand tongue. It is coarse grained, crossbedded, ferruginous, and micaceous. The upper unit of the Ripley formation is the upper limestone marl sand tongue. It consists of sandy limestone interbedded with sand and marl. The limestone is highly fossiliferous.

The Owl Creek formation consists of bluish, fossiliferous, glauconitic and micaceous fine sand. It is only 20 to 30 feet thick.

The basal portion of the Clayton formation contains beds of limestone separated and overlain by blue-gray marl. The limestone is light gray, iron stained, fossiliferous, and hard. The upper part of the Clayton is made up of beds of glauconitic sand and blue, micaceous marl.

The contact between the Porters Creek formation and the Clayton formation is marked by a layer of hard, light-gray sandstone a few inches to more than a foot thick. This sandstone layer is resistant to erosion and is responsible for several outliers of Porters Creek material east of the main Porters Creek outcrop.

The Porters Creek material can be separated into three phases. The basal phase is glauconitic and bentonitic silty clay. The typical phase, a massive montmorillonitic clay, is dark gray when wet and light gray when dry. The upper phase is silty, micaceous, laminated clay that is bluish black in color and contains a few scattered concretions of siderite. At a few locations, sand and sandstone are present near the top of the formations.

The Betheden formation, a residuum developed by weathering of the Porters Creek clay, contains kaolinitic and bauxitic clays. At some locations conditions were not favorable for development of the residuum or, if it developed, the residuum has been completely removed by erosion.

The Fearn Springs formation consists of interbedded red sand and white to light-gray silty or sandy clays. The material appears to be eroded and redeposited Betheden and Porters Creek material. Like the Betheden, the Fearn Springs does not have a continuous outcrop.

The Ackerman formation is made up of a basal red sand member and an upper clay member. Very coarse sand, pebbles, and scattered boulders of light-gray quartz and quartzite are present at the base of the red sand. The sand also contains rounded and angular lumps of light-colored clay, forming a clay-ball breccia. The upper clay member is dark gray, laminated, silty, and lignitic.

The Meridian formation consists chiefly of silty red sand.

Climatic conditions in Tippah County are favorable for deep weathering, and most rock materials near the surface have been weathered to a brownish or reddish soil. Exposures of unweathered material are few. The similarity of the material weathered from the various formations causes considerable confusion in determining the surface geology of the county.

In parts of the western two-thirds of the county, the surface is made up of layers of wind-deposited silt, or loess. This silt mantle is less than 4 feet thick and occurs where the slope is less than 12 percent.

Climate

The climate of Tippah County is influenced by the subtropical latitude, the huge land mass to the north, and the warm waters of the Gulf of Mexico some distance to the south. Local modifications are caused by variations in the topography.

In summer the prevailing southerly winds provide a moist tropical climate, but occasionally the pressure distribution is such that west or north winds bring hot, dry weather. In winter the county is subjected alternately to moist, tropical air and dry, cold air.

The relative humidity is 60 percent or more 68 percent of the time and below 40 percent only 19 percent of the time. When the temperature is 90° or higher, relative humidity seldom exceeds 79 percent.

There is a chance of the temperature falling to 20° or lower on 1 or more days in every year. Temperatures of 32° or lower (freezing) occur on an average of 65 days per year, and temperatures of 90° or higher occur on an average of 75 days a year. There is a 50 percent chance of a freeze after March 31 and before November 6. There is a 20 percent chance of a freeze after April 13 and before October 26. The average frost-free period is 220 days per year.

The average precipitation is 54 inches per year; about 26 inches falls during the growing season. The time of relatively light rainfall coincides with the harvest season in the fall.

There is a risk of a tornado about once in 4 years, and damaging windstorms occur on an average of once in 6 years. Damaging hailstorms occur on an average of once in 12 years. Measurable snow falls about three winters out of four.

Table 13 shows, by months, the average, the absolute maximum, and the absolute minimum temperatures at Booneville in Prentiss County, Miss. Temperature and precipitation recordings at the Ripley, Miss., weather station do not cover a sufficient length of time to be a reliable basis for calculating means and averages. Data from the Booneville, Miss., weather station is used because the weather there is more like the weather at

Ripley than is that at any other nearby station. The table also gives the average amount of rainfall for each month, the amounts in the driest and wettest years of record, and the average amount of snowfall.

TABLE 13.—*Temperature and precipitation at Booneville, Prentiss County, Miss.*

[Elevation, 503 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1943)	Wettest year (1932)	Average snowfall
	°F.	°F.	°F.	In.	In.	In.	In.
January	43.2	80	−10	6.17	2.89	13.65	2.3
February	44.8	80	−9	5.78	1.30	8.09	.6
March	52.3	90	9	6.33	6.78	4.94	--
April	61.2	94	25	4.76	1.07	5.52	--
May	69.5	97	36	4.14	5.27	1.49	--
June	77.6	107	46	3.48	1.76	3.48	--
July	80.2	108	50	4.24	1.37	7.85	--
August	79.9	107	49	3.39	0.30	5.50	
September	73.9	107	34	3.01	6.64	13.31	
October	63.6	97	26	2.84	0.46	9.76	--
November	50.9	85	2	4.65	3.95	3.85	.3
December	43.6	78	1	5.63	2.61	9.58	.5
Year	61.7	[3] 108	[4] 10	54.42	34.40	87.02	3.7

[1] Average temperature based on a 25-year record, through 1955; highest and lowest temperatures on a 61-year record, through 1958.
[2] Average precipitation based on a 25-year record, through 1955; wettest and driest years based on a 68-year record, in the period 1891-1958; snowfall based on a 22-year record, through 1952.
[3] Average annual highest temperature.
[4] Average annual lowest temperature.

Transportation

The Gulf, Mobile, and Ohio Railroad and State Highway No. 15 cross the county from north to south. U.S. Highway No. 72 extends east and west through the northern part of the county. State Highway No. 4 runs east and west and intersects No. 15 at Ripley near the center of the county. Several short paved and unpaved State highways extend into other sections of the county. Most other roads, with the exception of those in isolated areas, have a gravel surface and are usable throughout the year.

Seven gas transmission lines cross the county, and electricity from the TVA is transmitted by the Tippah Electric Power Association.

Agriculture

The county has always been predominantly agricultural, and cotton has always been the most important crop. The cotton acreage increased rapidly from 1837, when 413 bales were ginned, until the Civil War. In 1883, there were 10,842 bales shipped from Ripley. The cotton acreage decreased one-third between 1939 and 1959, but production more than doubled. The increase in the corn acreage during these 20 years approximately equaled the decrease in cotton acreage.

The trend in agriculture is toward larger units, fewer row crops, and more livestock. The size of farms is increasing slightly, and the number is decreasing. The acreage of harvested cropland is decreasing, and the acreage of permanent pasture is increasing. During the past 10 years, there has been a significant decrease in the number of farms producing cotton and a significant increase in the number of dairy and other livestock farms. Although the farming acreage is small, the trend is toward mechanized equipment.

According to the 1959 Census of Agriculture, there were 1,937 farm operators in Tippah County. Of this number, 962 were employed off the farm, and of this number 561 worked for 100 or more days and 789 reported that their off-farm income exceeded their farm income.

There is a total of 210,509 acres in farms in the county and 110,100 acres of cleared land.

In the agricultural census of 1959, the farms were classified according to main source of income as follows:

All farms	1,937
Cotton farms	722
Cash-grain farms	12
Poultry farms	25
Dairy farms	85
Other livestock	102
General farms	100

The farms were classified by size as follows:

Less than 50 acres	635
Less than 100 acres	1,204
100 to 219 acres	548
219 to 499 acres	166
500 acres or more	19

The census of livestock in 1959 was as follows:

Cattle and calves	16,238
Cows, including heifers that have calved	9,094
Milk cows	6,195
Heifers and calves	5,531
Steers and bulls, including calves	1,613
Horses and mules	1 906
Hogs and pigs	17 309
Sheep and lambs	67
Chickens, 4 months and over	116,140
Turkeys	1,706

The acreage of principal crops in Tippah County in 1959 was as follows:

Corn	24,894
Sorghum silage	354
Soybeans for beans	1,574
Soybeans for hay	683
Clover and timothy mixture for hay	408
Lespedeza	4,970
Cotton	14,440

The types of farm operators were as follows:

Full owners	1,019
Part owners	362
Managers	1
All tenants	555

The following facilities and equipment on farms were listed in the 1959 census:

Telephones	420
Home freezers	756
Milking machines	99
Electric milk coolers	99
Grain combines	25
Cornpickers	103
Pickup hay balers	53
Field forage harvesters	48
Motortrucks	910
Tractors	1,095
Automobiles	1,171

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Clay. As a soil separate, mineral particles that are less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt. (See also Texture, soil.)

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors that consist of concentrations of compounds or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or into individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon; 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originated, with special reference to the processes responsible for the development of the solum, or true soil, from the unconsolidated parent material.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

Morphology, soil. The makeup of the soil, including the texture, structure, consistence, color, and other physical, mineralogical, and biological properties of the various horizons of the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural drainage. The conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Imperfectly or somewhat poorly drained soils are wet for significant periods; in podzolic soils there are commonly mottlings below 6 to 16 inches in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Permeability. The quality that enables water or air to move through the soil. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid not alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4–7.8
Very strongly acid	4.5–5.0	Moderately alkaline	7.9–8.4
Strongly acid	5.1–5.5	Strongly alkaline	8.5–9.0
Medium acid	5.6–6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1–6.5		
Neutral	6.6–7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. As a soil separate, individual rock or mineral fragments 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but they may be any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeters) to the lower limit of very fine sand (0.05 millimeters). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting upon parent material, as conditioned by relief, over periods of time.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Topsoil. A presumed fertile soil or soil material, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

GUIDE TO MAPPING UNITS

[See table 1, p. 8 , for approximate acreage and proportionate extent of soils; table 2, p. 39, and table 3, p. 40, for estimated average acre yields; and table 6, p. 54, table 7, p. 60, and table 8, p. 64, for engineering properties of soils]

Map symbol	Mapping unit	Page	Capability unit		Woodland group	
			Symbol	Page	Number	Page
Ao	Almo silt loam	7	IIIw-2	35	5	47
AtB2	Atwood silt loam, 2 to 5 percent slopes, eroded	8	IIe-1	31	2	43
AtB3	Atwood silt loam, 2 to 5 percent slopes, severely eroded	9	IIIe-1	33	2	43
AtC3	Atwood silt loam, 5 to 8 percent slopes, severely eroded	9	IIIe-1	33	2	43
AtD3	Atwood silt loam, 8 to 12 percent slopes, severely eroded	9	IVe-1	35	2	43
BuA	Bude silt loam, 0 to 2 percent slopes	10	IIIw-1	34	3	43
BuB	Bude silt loam, 2 to 5 percent slopes	10	IIIw-1	34	3	43
BuB2	Bude silt loam, 2 to 5 percent slopes, eroded	10	IIIw-1	34	3	43
Ch	Chastain soils	11	IVw-1	36	8	48
Cn	Collins silt loam	11	IIw-2	32	6	47
Co	Collins silt loam, local alluvium	11	IIw-2	32	6	47
DuB2	Dulac silt loam, 2 to 5 percent slopes, eroded	12	IIe-2	32	2	43
DuB3	Dulac silt loam, 2 to 5 percent slopes, severely eroded	12	IIIe-2	34	2	43
DuC3	Dulac silt loam, 5 to 8 percent slopes, severely eroded	13	IVe-2	35	2	43
DwD	Dulac-Wilcox complex, 8 to 12 percent slopes	13				
	Dulac	--	(1/)	---	9	48
	Wilcox	--	(2/)	---	9	48
DwD3	Dulac-Wilcox complex, 8 to 12 percent slopes, severely eroded	13				
	Dulac	--	(1/)	---	9	48
	Wilcox	--	(2/)	---	9	48
Fa	Falaya silt loam	14	IIw-3	33	6	47
Fc	Falaya silt loam, local alluvium	14	IIw-3	33	6	47
Ff	Falaya silt loam, overflow	14	Vw-1	37	6	47
FkA	Falkner silt loam, 0 to 2 percent slopes	15	IIIw-1	34	3	43
FkB2	Falkner silt loam, 2 to 5 percent slopes, eroded	15	IIIw-1	34	3	43
FkB3	Falkner silt loam, 2 to 5 percent slopes, severely eroded	15	IVe-3	36	3	43
FkC2	Falkner silt loam, 5 to 8 percent slopes, eroded	15	IIIe-3	34	3	43
FkC3	Falkner silt loam, 5 to 8 percent slopes, severely eroded	16	IVe-3	36	3	43
FrB2	Freeland silt loam, 2 to 5 percent slopes, eroded	16	IIe-2	32	2	43
Gc	Gullied land, clayey	16	VIIe-2	38	12	50
Gn	Gullied land, sandy	17	VIIe-2	38	12	50
HaA	Hatchie silt loam, 0 to 2 percent slopes	18	IIIw-1	34	3	43
HaB	Hatchie silt loam, 2 to 5 percent slopes	18	IIIw-1	34	3	43
Ik	Iuka soils	18	IIw-1	32	7	48
Iu	Iuka soils, local alluvium	19	IIw-1	32	7	48
Ma	Mantachie soils	19	IIw-4	33	7	48
Mc	Mantachie soils, local alluvium	19	IIw-4	33	7	48
Mf	Mantachie soils, overflow	19	Vw-1	37	7	48
Mn	Mixed alluvial land	20	(3/)	---	13	51
Mo	Mixed alluvial land, overflow	20	Vw-1	37	13	51
OrB3	Ora loam, 2 to 5 percent slopes, severely eroded	21	IIIe-2	34	4	46
OrC3	Ora loam, 5 to 8 percent slopes, severely eroded	21	IVe-2	35	4	46
OrD3	Ora loam, 8 to 12 percent slopes, severely eroded	21	VIe-1	37	4	46
OsB2	Ora silt loam, 2 to 5 percent slopes, eroded	20	IIe-2	32	4	46
OsC2	Ora silt loam, 5 to 8 percent slopes, eroded	21	IIIe-2	34	4	46
PdB2	Providence silt loam, 2 to 5 percent slopes, eroded	22	IIe-2	32	2	43
PdB3	Providence silt loam, 2 to 5 percent slopes, severely eroded	22	IIIe-2	34	2	43
PdC2	Providence silt loam, 5 to 8 percent slopes, eroded	22	IIIe-2	34	2	43
PdC3	Providence silt loam, 5 to 8 percent slopes, severely eroded	23	IVe-2	35	2	43
PdD3	Providence silt loam, 8 to 12 percent slopes, severely eroded	23	VIe-1	37	2	43
RnE	Ruston soils, 12 to 17 percent slopes	23	VIe-2	37	1	43
RnE2	Ruston soils, 12 to 17 percent slopes, eroded	24	VIe-2	37	1	43
RnF	Ruston soils, 17 to 45 percent slopes	24	VIIe-1	37	1	43
RsE	Ruston-Cuthbert association, moderately steep	24				
	Ruston	--	VIe-2	37	11	50
	Cuthbert	--	(2/)	---	11	50
RsE2	Ruston-Cuthbert association, moderately steep, eroded	24				
	Ruston	--	VIIe-1	37	11	50
	Cuthbert	--	(2/)	---	11	50
RsF	Ruston-Cuthbert association, steep	25	(2/)	---	11	50
RuE2	Ruston-Cuthbert-Shubuta association, moderately steep, eroded	25				
	Ruston	--	VIIe-1	37	11	50
	Cuthbert	--	(2/)	---	11	50
	Shubuta	--	(2/)	---	11	50
RuF	Ruston-Cuthbert-Shubuta association, steep	26	(2/)	---	11	50
Tc	Tickfaw silt loam	26	IIIw-2	35	5	47
Ur	Urbo silty clay loam	27	IIw-4	33	8	48
Wb	Waverly and Bibb soils	27	IVw-1	36	8	48
WcE	Wilcox-Cuthbert association, moderately steep	28	(2/)	---	10	49
WcE3	Wilcox-Cuthbert association, moderately steep, severely eroded	28	(2/)	---	10	49
WcF	Wilcox-Cuthbert association, steep	29	(2/)	---	10	49
WcF3	Wilcox-Cuthbert association, steep, severely eroded	29	(2/)	---	10	49

1/ Subclass IVe; no unit classification.

2/ Subclass VIIe; no unit classification.

3/ Subclass IVw; no unit classification.

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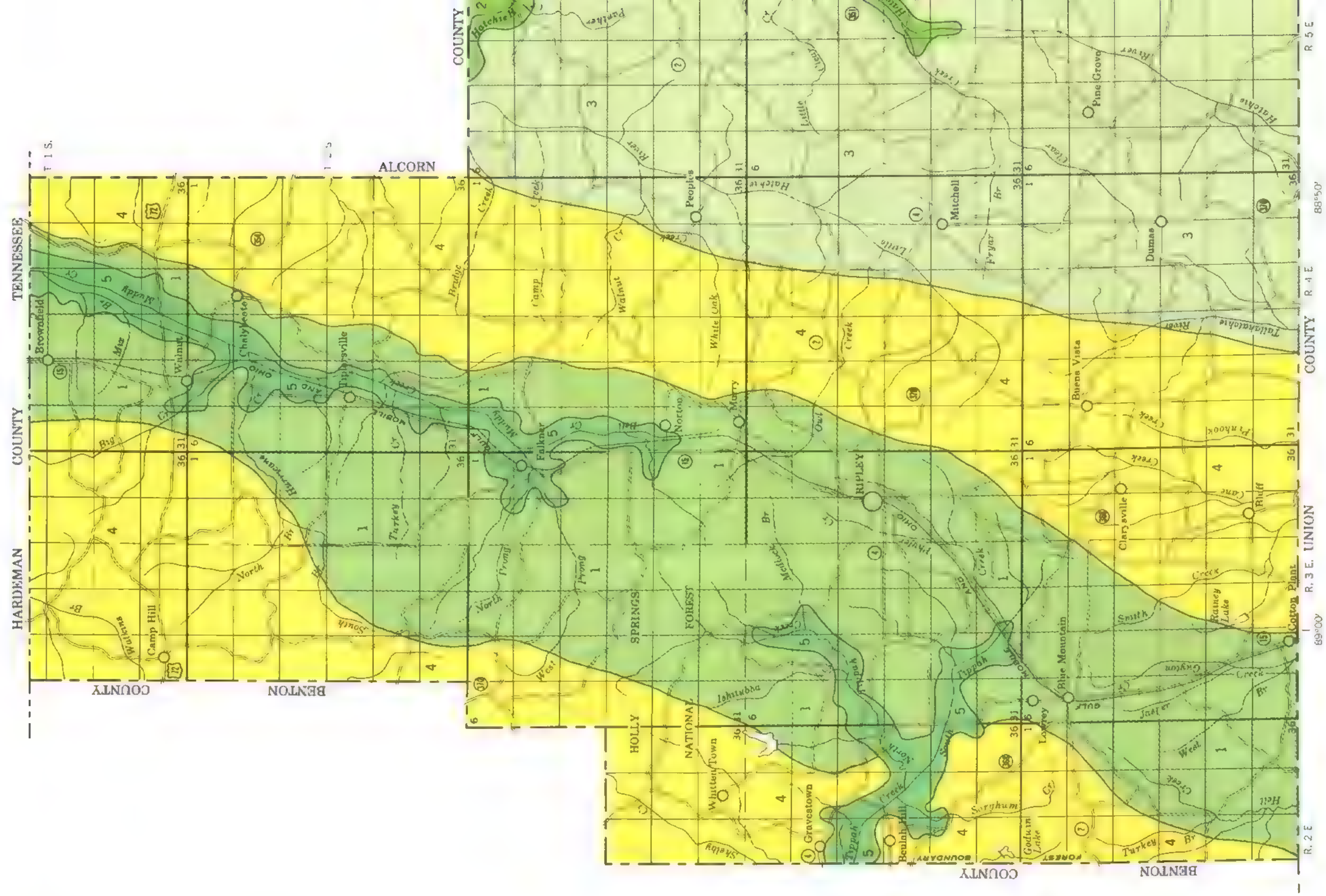
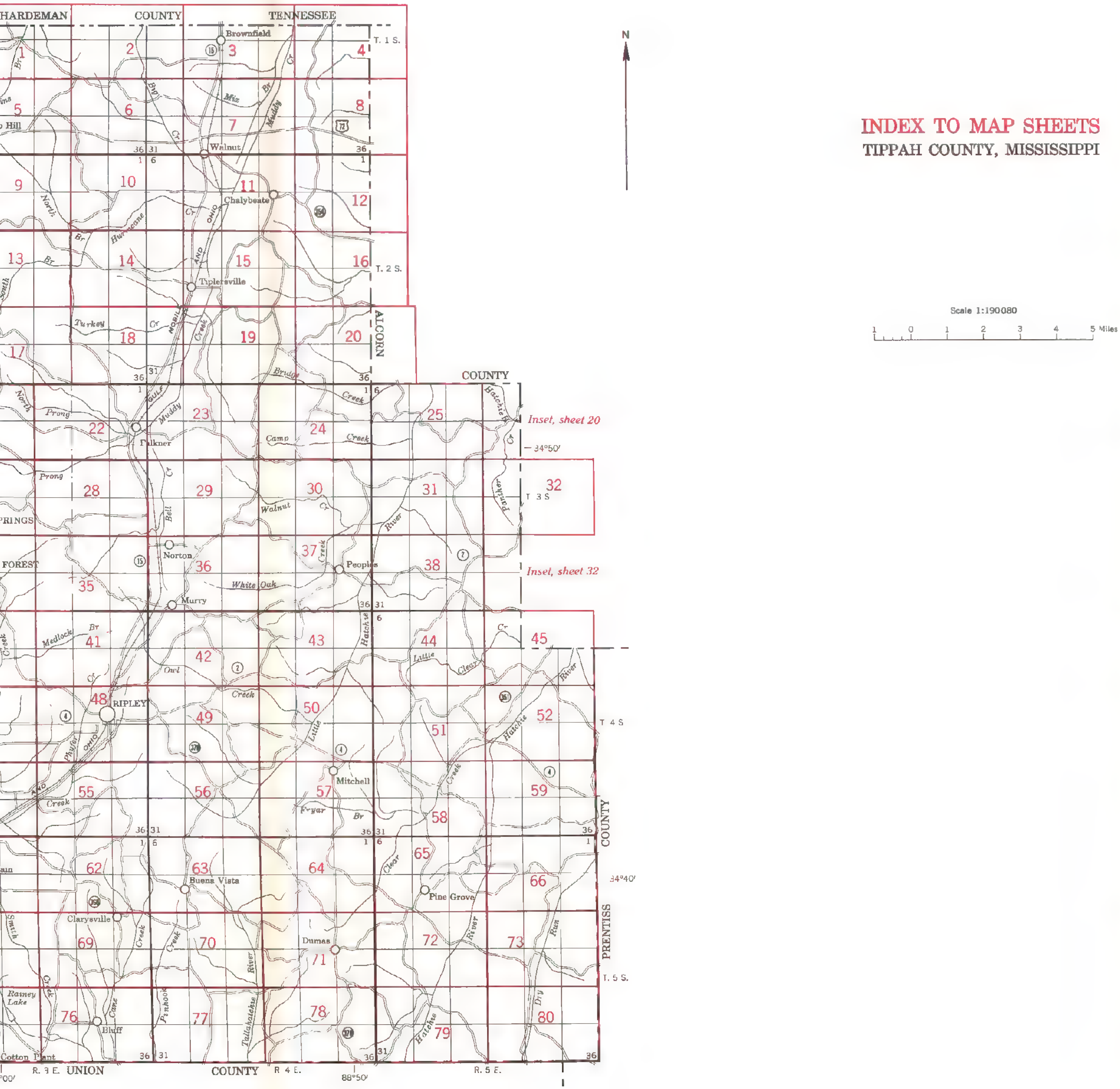


ALCORN
COUNTY
TENNESSEE
HARDEMAN
BENTON
UNION
Brownfield
Walnut
Chalybeate
Tiplersville
Falkner
Peoples
Mitchell
Dumas
Pine Grove
Buena Vista
Norton
Murry
RIPLEY
Clarysville
Bluff
Blue Mountain
Cotton Plant
Camp Hill
Whitten Town
Gravestown
Beulah Hill
Lowrey
HOLLY SPRINGS NATIONAL FOREST
R. 2 E.
R. 3 E.
R. 4 E.
R. 5 E.
T. 1 S.
89°00'
88°50'



INDEX TO MAP SHEETS

TIPPAH COUNTY, MISSISSIPPI

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TIPPAH COUNTY, MISSISSIPPI

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F shows the slope. Symbols for nearly level soils, such as Falaya silt loam, do not contain a slope letter. Neither does the symbol for a land type that has a considerable range in slope—Gullied land, sandy. The number, 2 or 3, in a symbol indicates that the soil is eroded or severely eroded.

SYMBOL	NAME
Ao	Almo silt loam
AtB2	Atwood silt loam, 2 to 5 percent slopes, eroded
AtB3	Atwood silt loam, 2 to 5 percent slopes, severely eroded
AtC3	Atwood silt loam, 5 to 8 percent slopes, severely eroded
AtD3	Atwood silt loam, 8 to 12 percent slopes, severely eroded
BuA	Bude silt loam, 0 to 2 percent slopes
BuB	Bude silt loam, 2 to 5 percent slopes
BuB2	Bude silt loam, 2 to 5 percent slopes, eroded
Ch	Chastain soils
Cn	Collins silt loam
Co	Collins silt loam, local alluvium
DuB2	Dulac silt loam, 2 to 5 percent slopes, eroded
DuB3	Dulac silt loam, 2 to 5 percent slopes, severely eroded
DuC3	Dulac silt loam, 5 to 8 percent slopes, severely eroded
DwD	Dulac–Wilcox complex, 8 to 12 percent slopes
DwD3	Dulac–Wilcox complex, 8 to 12 percent slopes, severely eroded
Fa	Falaya silt loam
Fc	Falaya silt loam, local alluvium
Ff	Falaya silt loam, overflow
FkA	Falkner silt loam, 0 to 2 percent slopes
FkB2	Falkner silt loam, 2 to 5 percent slopes, eroded
FkB3	Falkner silt loam, 2 to 5 percent slopes, severely eroded
FkC2	Falkner silt loam, 5 to 8 percent slopes, eroded
FkC3	Falkner silt loam, 5 to 8 percent slopes, severely eroded
FrB2	Freeland silt loam, 2 to 5 percent slopes, eroded
Gc	Gullied land, clayey
Gn	Gullied land, sandy
HoA	Hatchie silt loam, 0 to 2 percent slopes
HoB	Hatchie silt loam, 2 to 5 percent slopes
Ik	Iuka soils
Iu	Iuka soils, local alluvium
Ma	Mantachie soils
Mc	Mantachie soils, local alluvium
Mf	Mantachie soils, overflow
Mn	Mixed alluvial land
Mo	Mixed alluvial land, overflow
OrB3	Ora loam, 2 to 5 percent slopes, severely eroded
OrC3	Ora loam, 5 to 8 percent slopes, severely eroded
OrD3	Ora loam, 8 to 12 percent slopes, severely eroded
OsB2	Ora silt loam, 2 to 5 percent slopes, eroded
OsC2	Ora silt loam, 5 to 8 percent slopes, eroded
PdB2	Providence silt loam, 2 to 5 percent slopes, eroded
PdB3	Providence silt loam, 2 to 5 percent slopes, severely eroded
PdC2	Providence silt loam, 5 to 8 percent slopes, eroded
PdC3	Providence silt loam, 5 to 8 percent slopes, severely eroded
PdD3	Providence silt loam, 8 to 12 percent slopes, severely eroded
RnE	Ruston soils, 12 to 17 percent slopes
RnE2	Ruston soils, 12 to 17 percent slopes, eroded
RnF	Ruston soils, 17 to 45 percent slopes
RsE	Ruston–Cuthbert association, moderately steep
RsE2	Ruston–Cuthbert association, moderately steep, eroded
RsF	Ruston–Cuthbert association, steep
RuE2	Ruston–Cuthbert–Shubuta association, moderately steep, eroded
RuF	Ruston–Cuthbert–Shubuta association, steep
Tc	Tickfaw silt loam
Ur	Urbo silty clay loam
Wb	Waverly and Bibb soils
WcE	Wilcox–Cuthbert association, moderately steep
WcE3	Wilcox–Cuthbert association, moderately steep, severely eroded
WcF	Wilcox–Cuthbert association, steep
WcF3	Wilcox–Cuthbert association, steep, severely eroded

WORKS AND STRUCTURES

Highways and roads

- Dual
- Good motor
- Poor motor
- Trail

Highway markers

- National Interstate
- U. S.
- State

Railroads

- Single track
- Multiple track
- Abandoned

Bridges and crossings

- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings

School

Church

Station

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Forest fire or lookout station

C

Nat onal or s
County
Township, U
Section line,
Reservation
Land grant

Streams
Perennial
Intermitte
Canals and
Lakes and
Perennia
Interm tt
We ls
Springs
Marsh
Wet spot
Alluvial fa

Escarpmen
Bedrock
Other
Prominent
Depressio
Crossal
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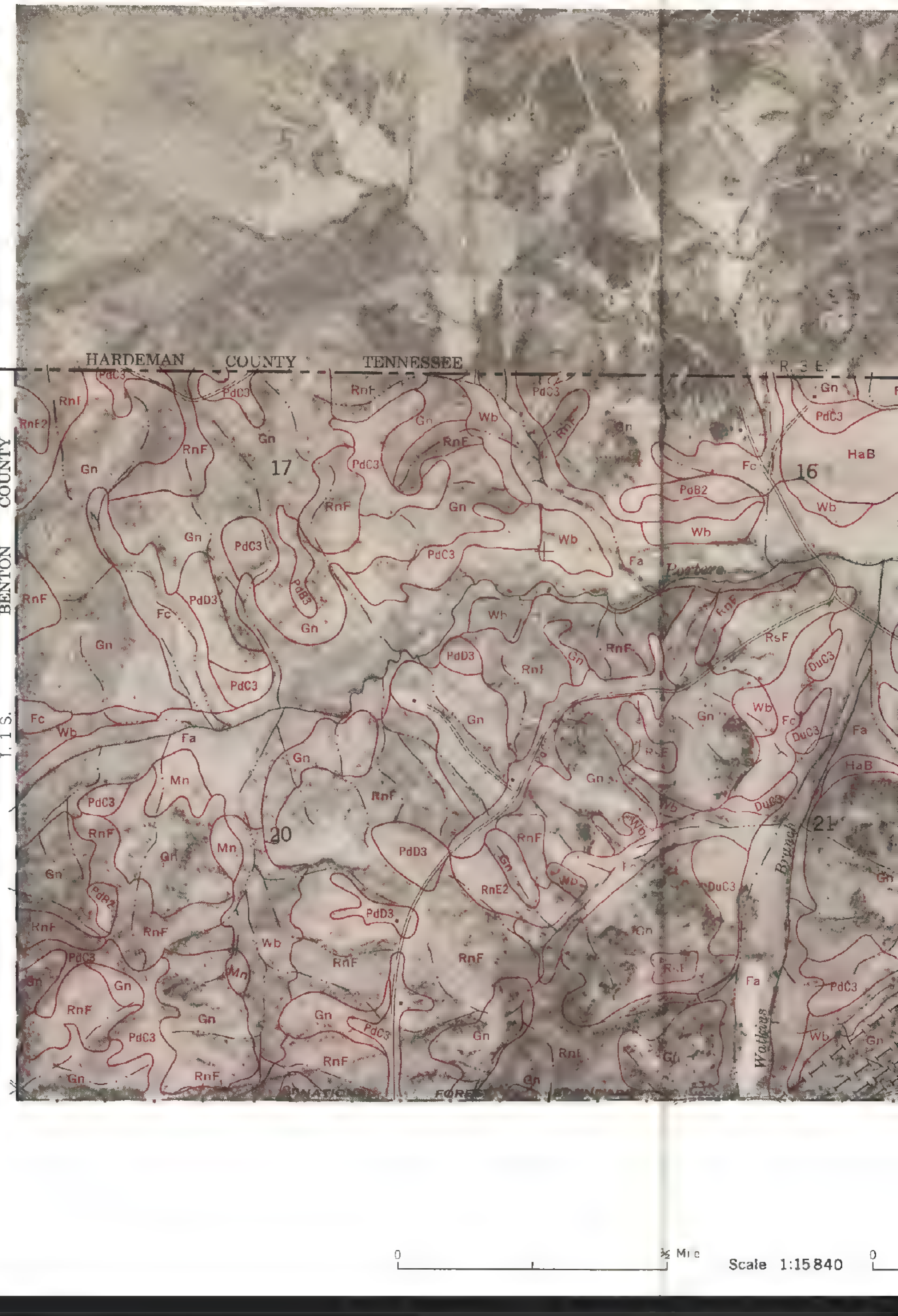

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MISSISSIPPI — SHEET NUMBER 2

T. 1 S.

(Joins sheet 3)

Scale 1:15840 0 3000 Feet

(Joins sheet 2)

T. 1 S.

0 ½ Mile Scale 1:15 840 0

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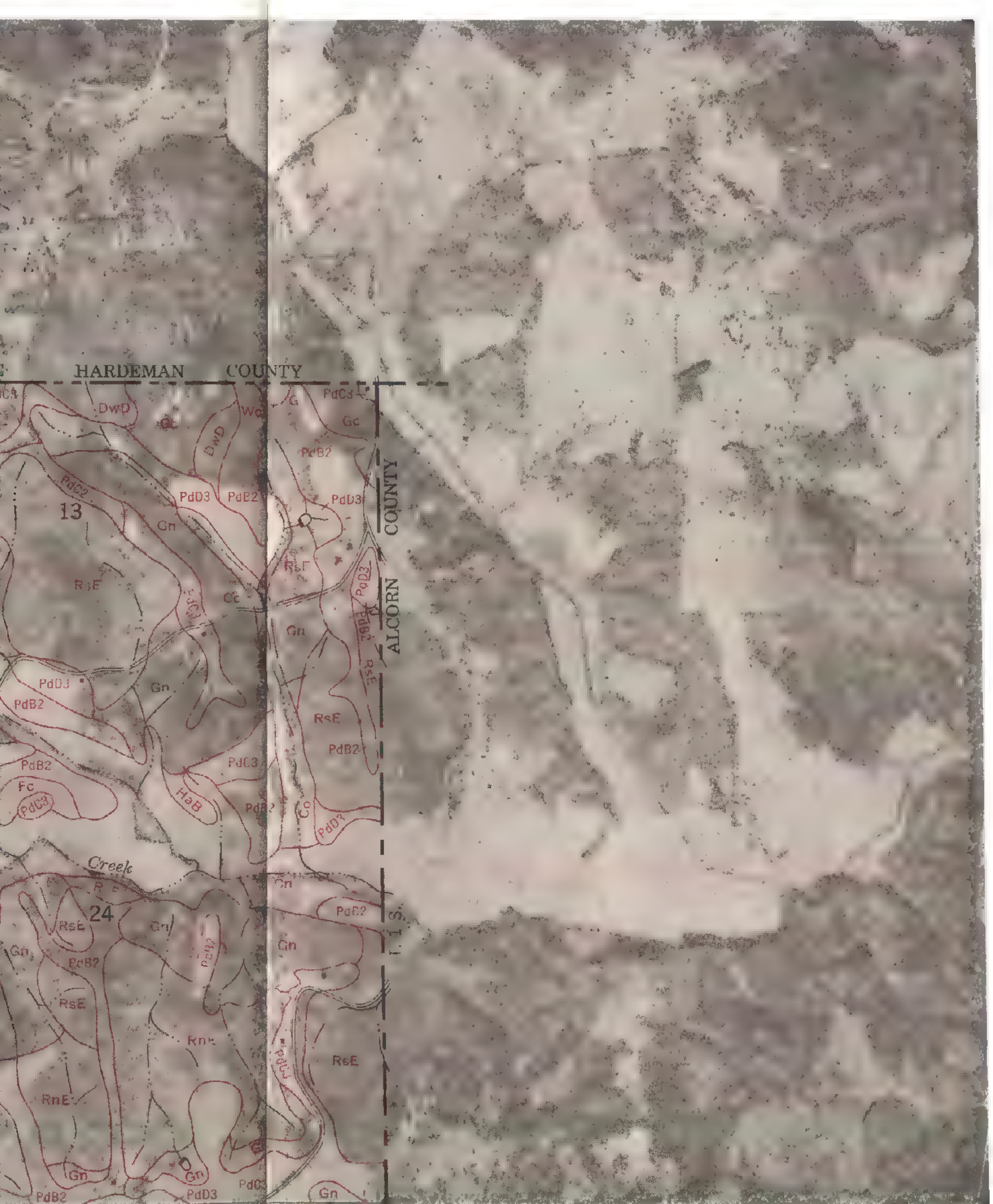
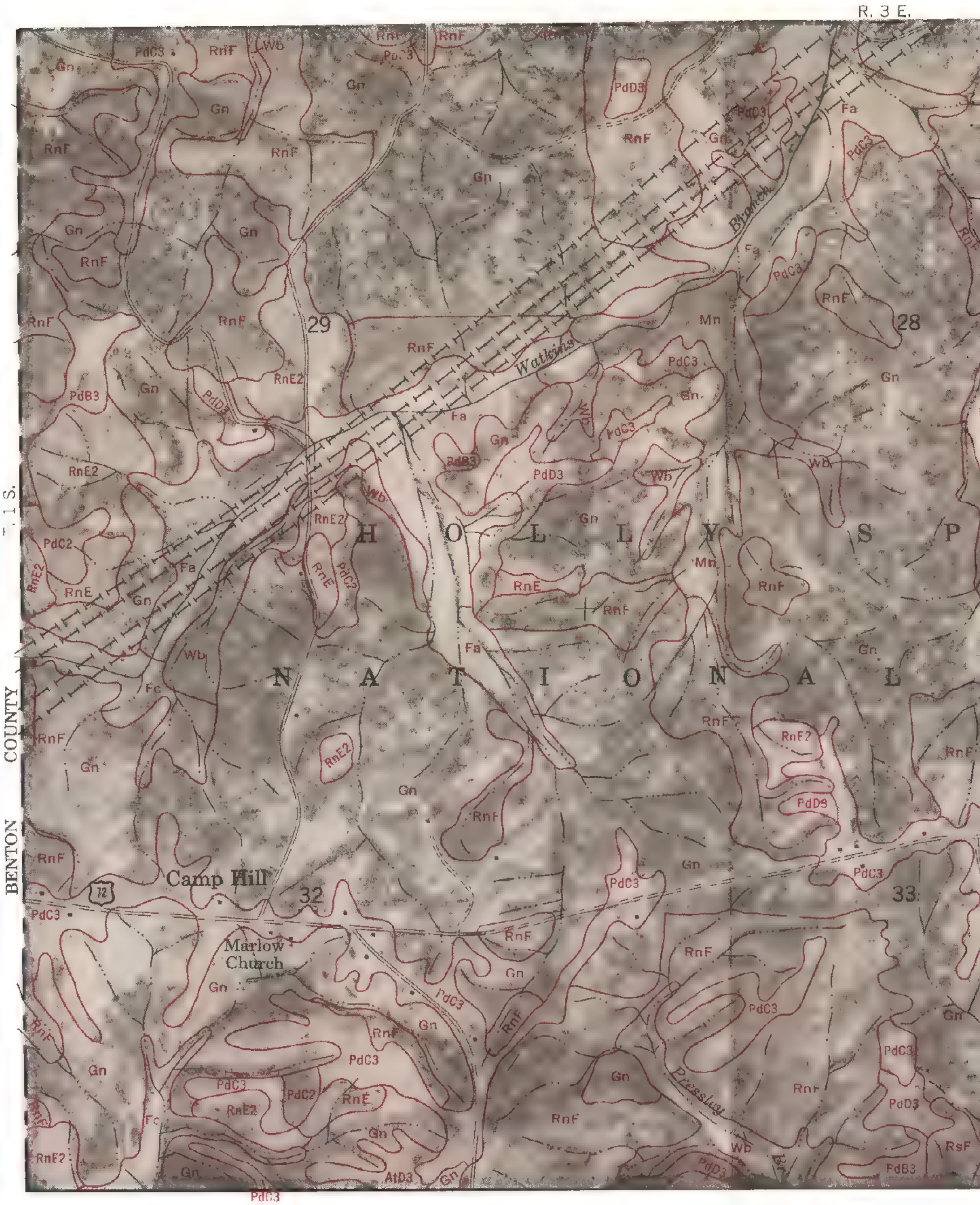


ale 1:15840 0 3000 Feet



0 ½ Mile Scale 1:15840

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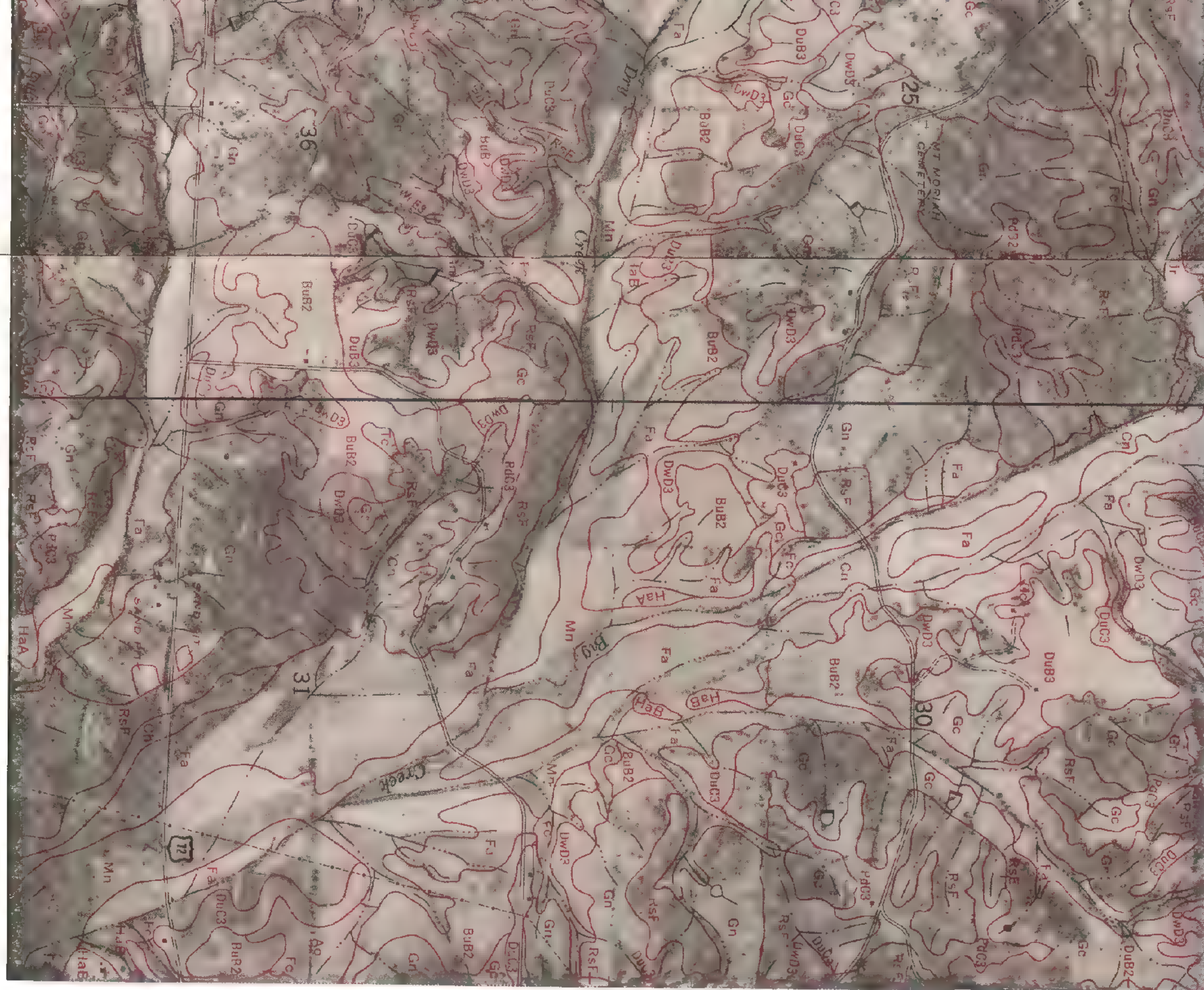
Scale 1:15840

0

3000 Feet

R. 3 E. | R. 4 E.



(Joins sheet 7)

T. 1 S.

R. 4 E.

T. 1 S.

(Joins sheet 6)

0 ½ Mile Scale 1:15840

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le 1:15840 0 3000 Feet

0 ½ Mile Scale 1:15840 0

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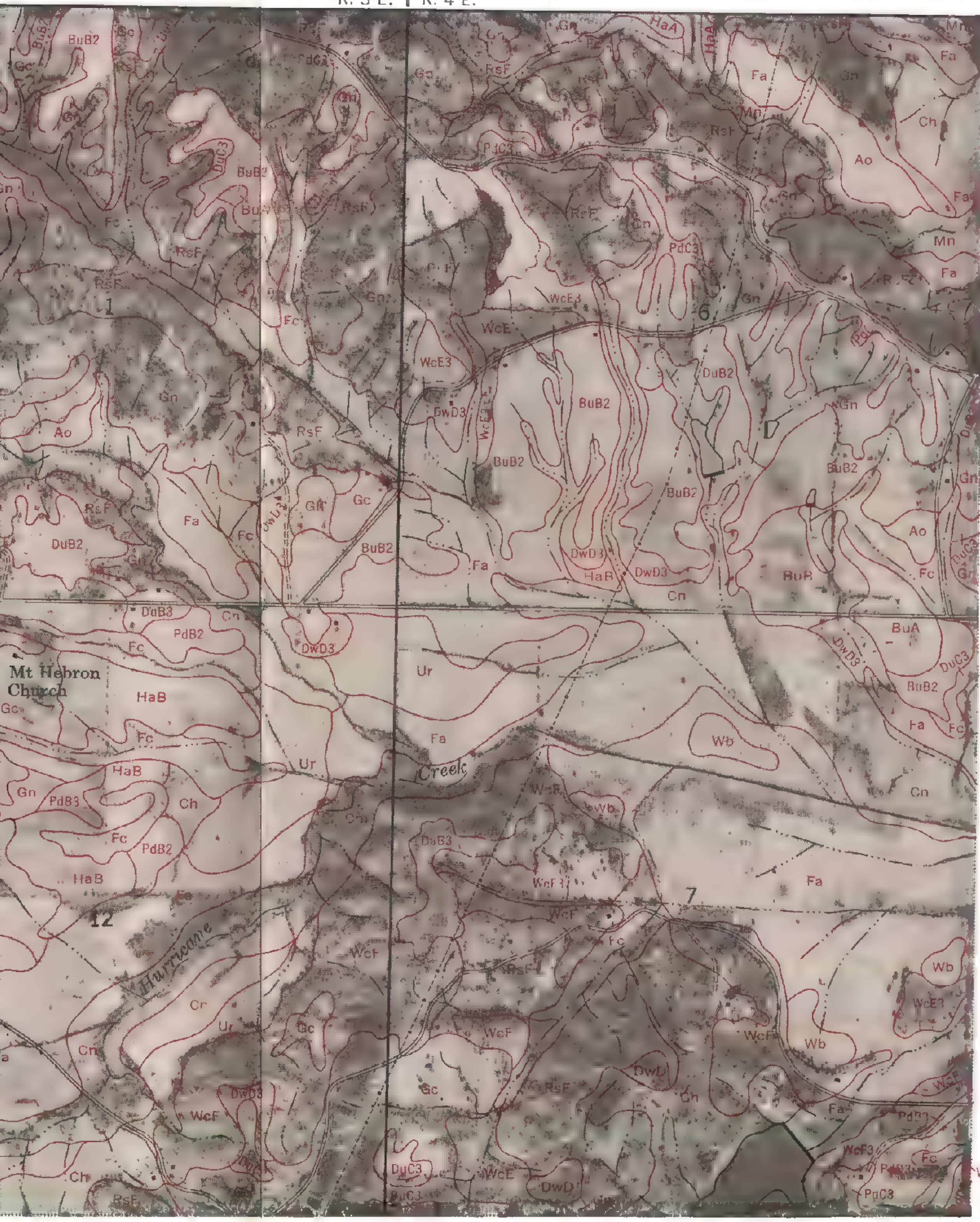
R. 3 E. | R. 4 E.



T. 2 S.

(Joins sheet 11)

Scale 1:15840 0 3000 Feet

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R. 4 E

T. 2 S.

(Joins sheet 10)

0 ½ Mile Scale 1:15 840 0

Scale 1:15 840 0 3 000 Feet

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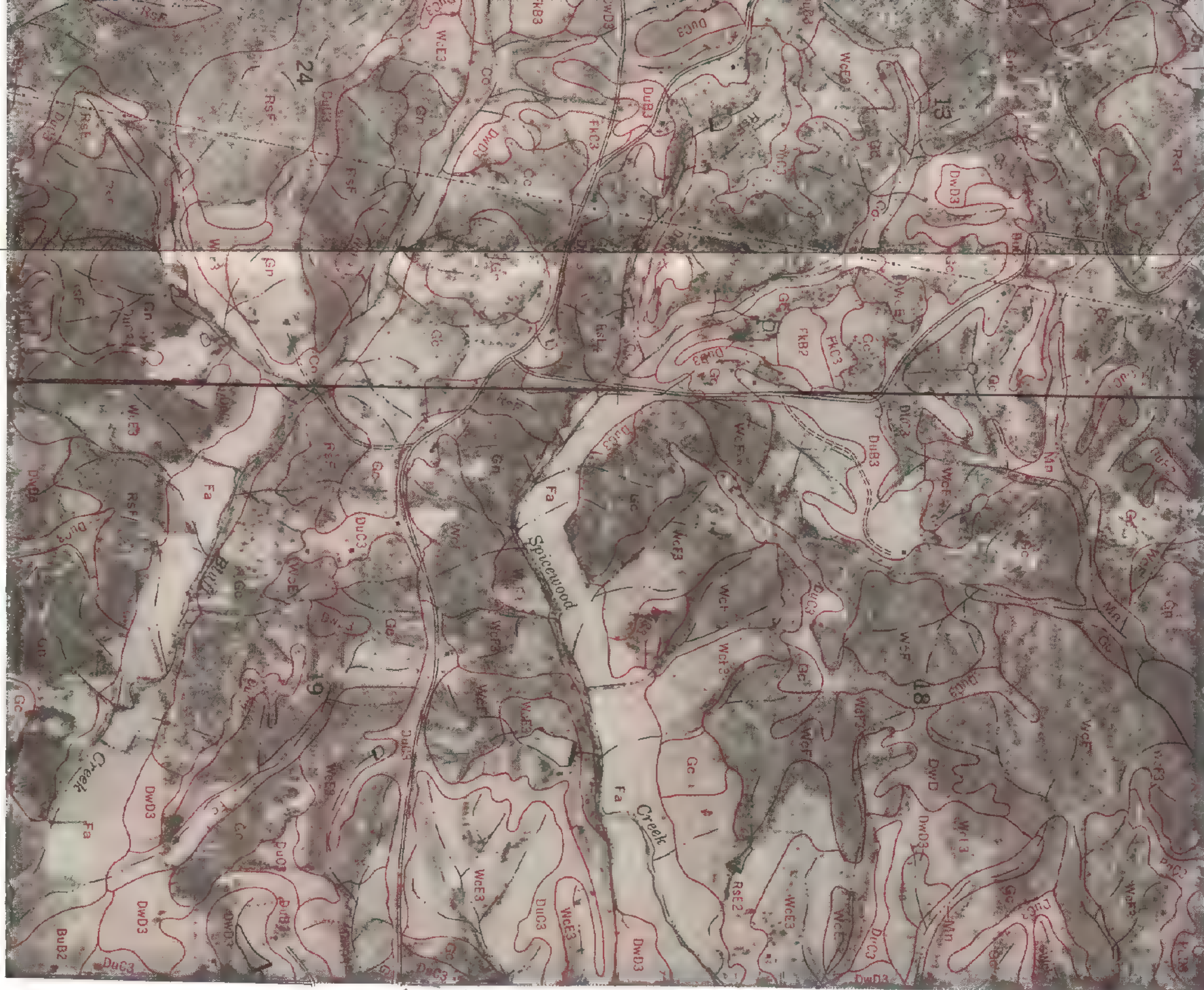
Scale 1:15840

0

3000 Feet



(Joins sheet 15)

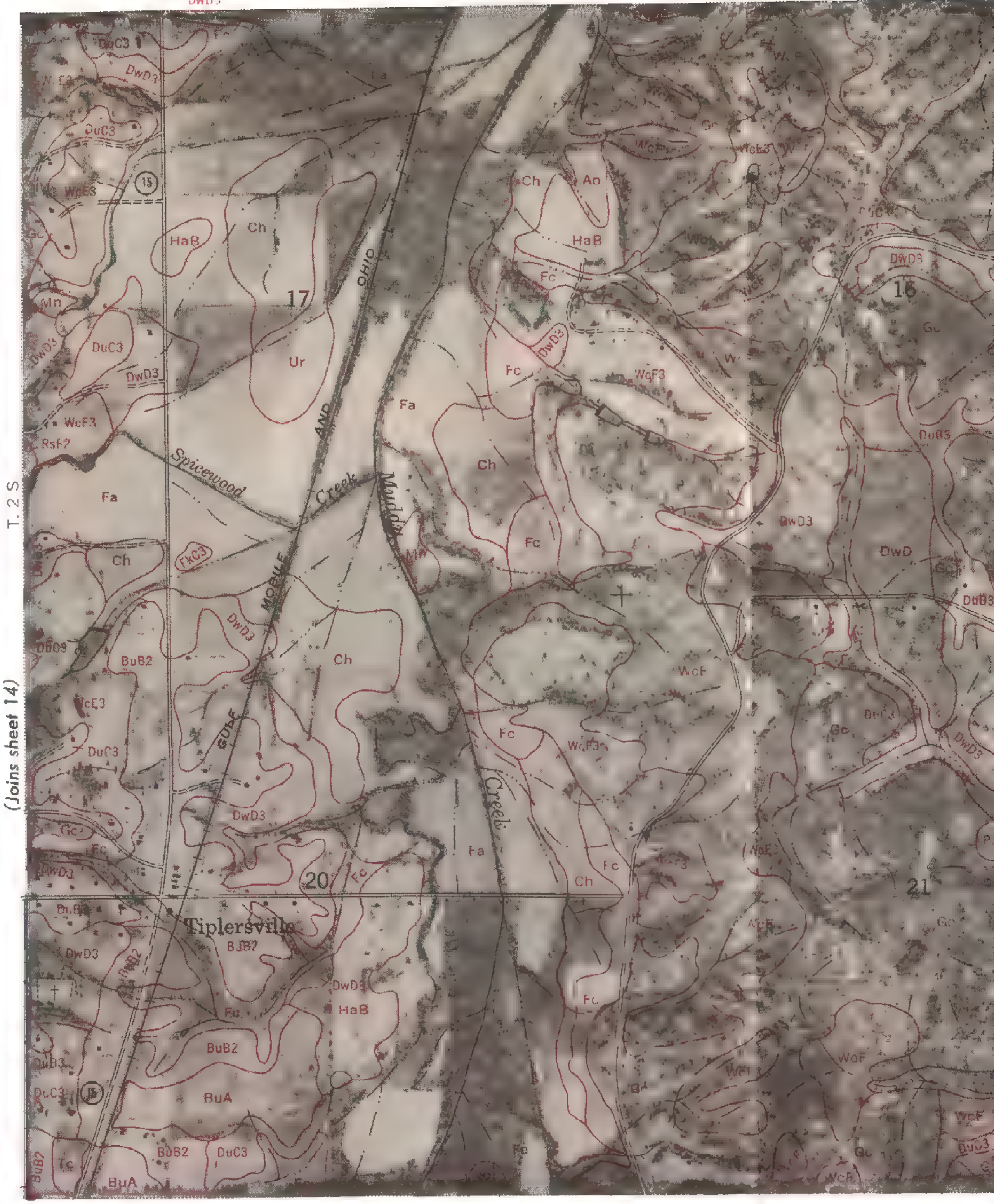
T. 2 S.

TIPPAH COUNTY, MISSISSIPPI —

R. 4 E.

T. 2 S.

(Joins sheet 14)



½ Mile

Scale 1:15840

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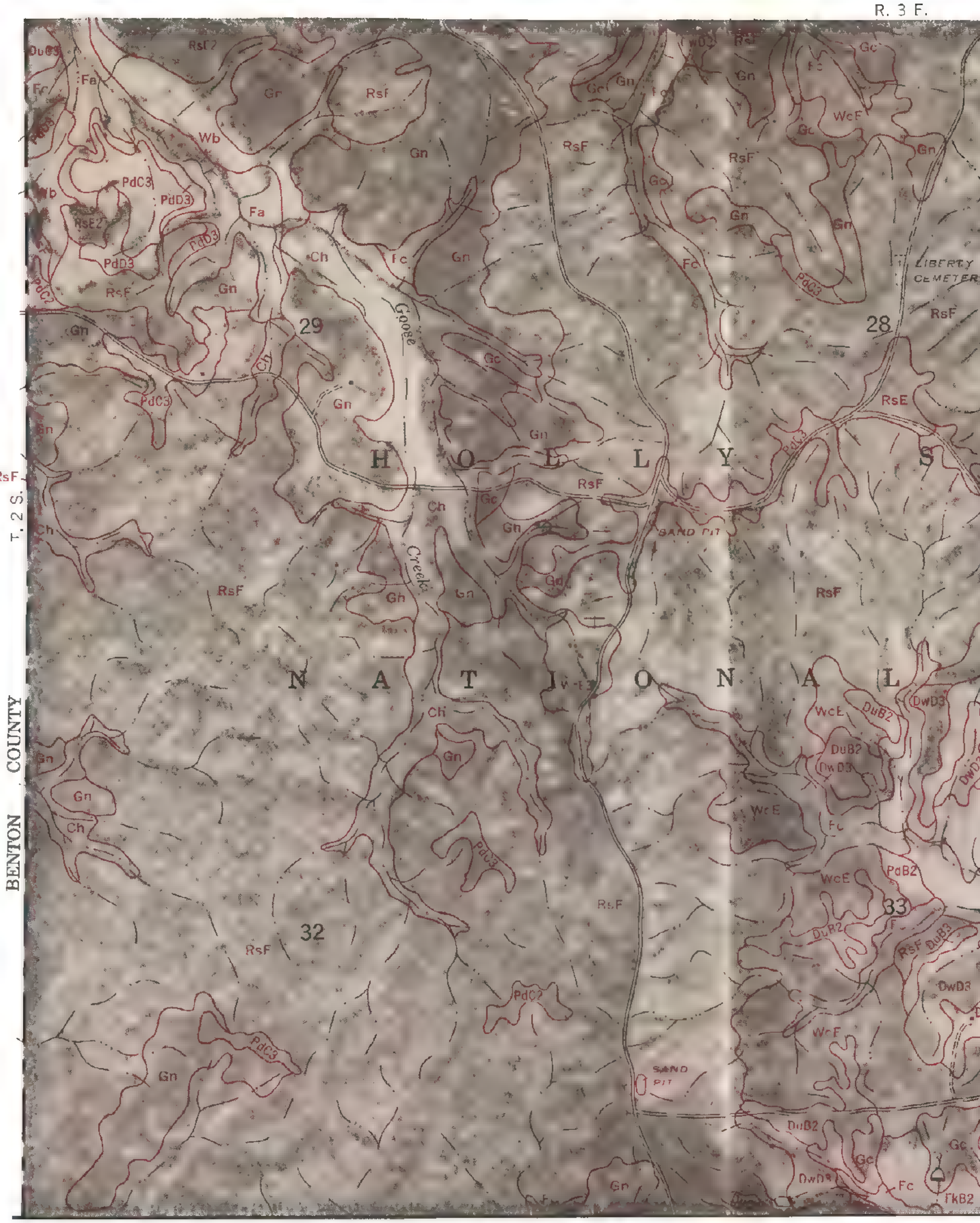
Range, township, and section corners on this map are indefinite.

cale 1:15840 0 3000 Feet



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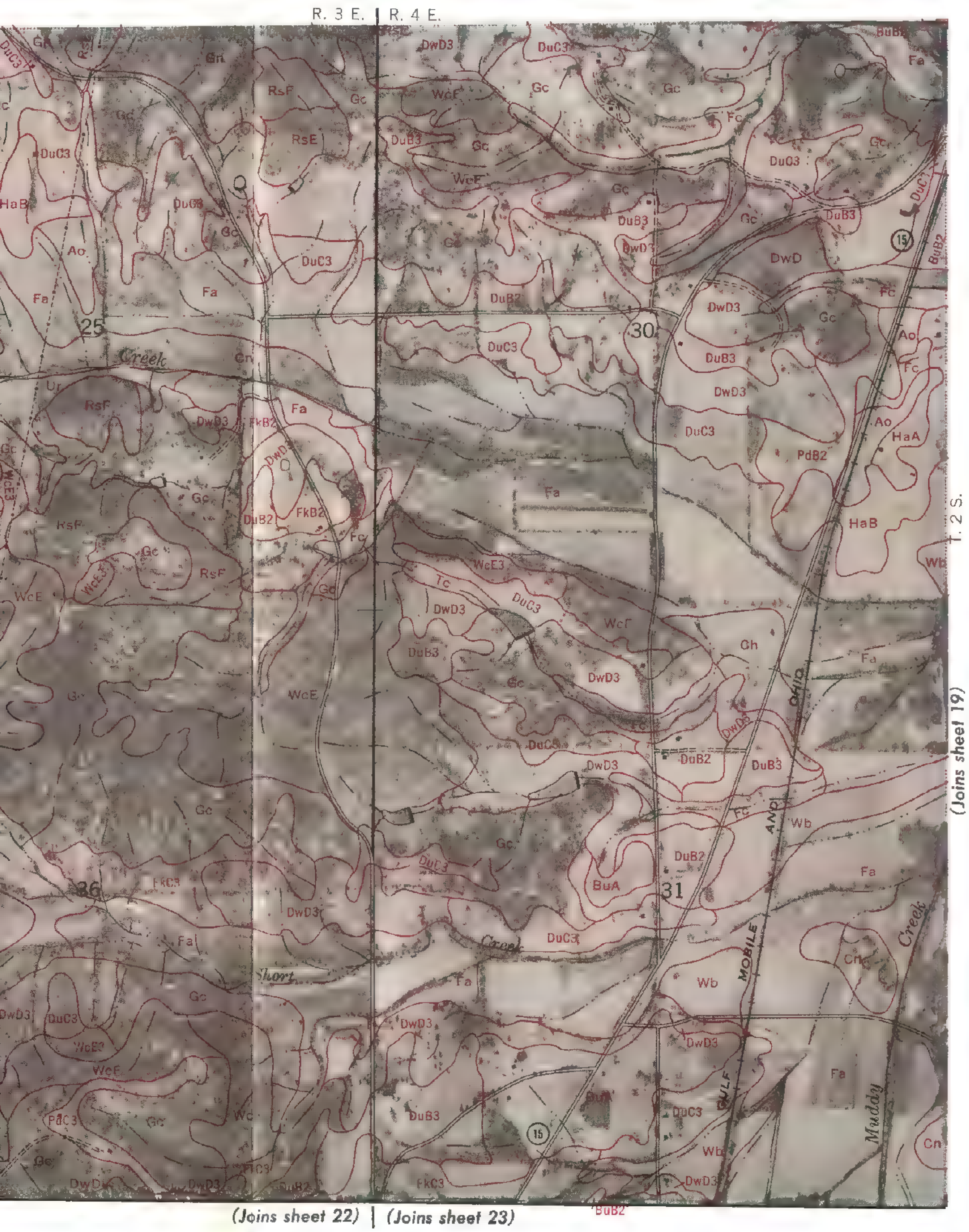
0 ½ Mile Scale 1:15 840 0



Scale 1:15840 0 3000 Feet

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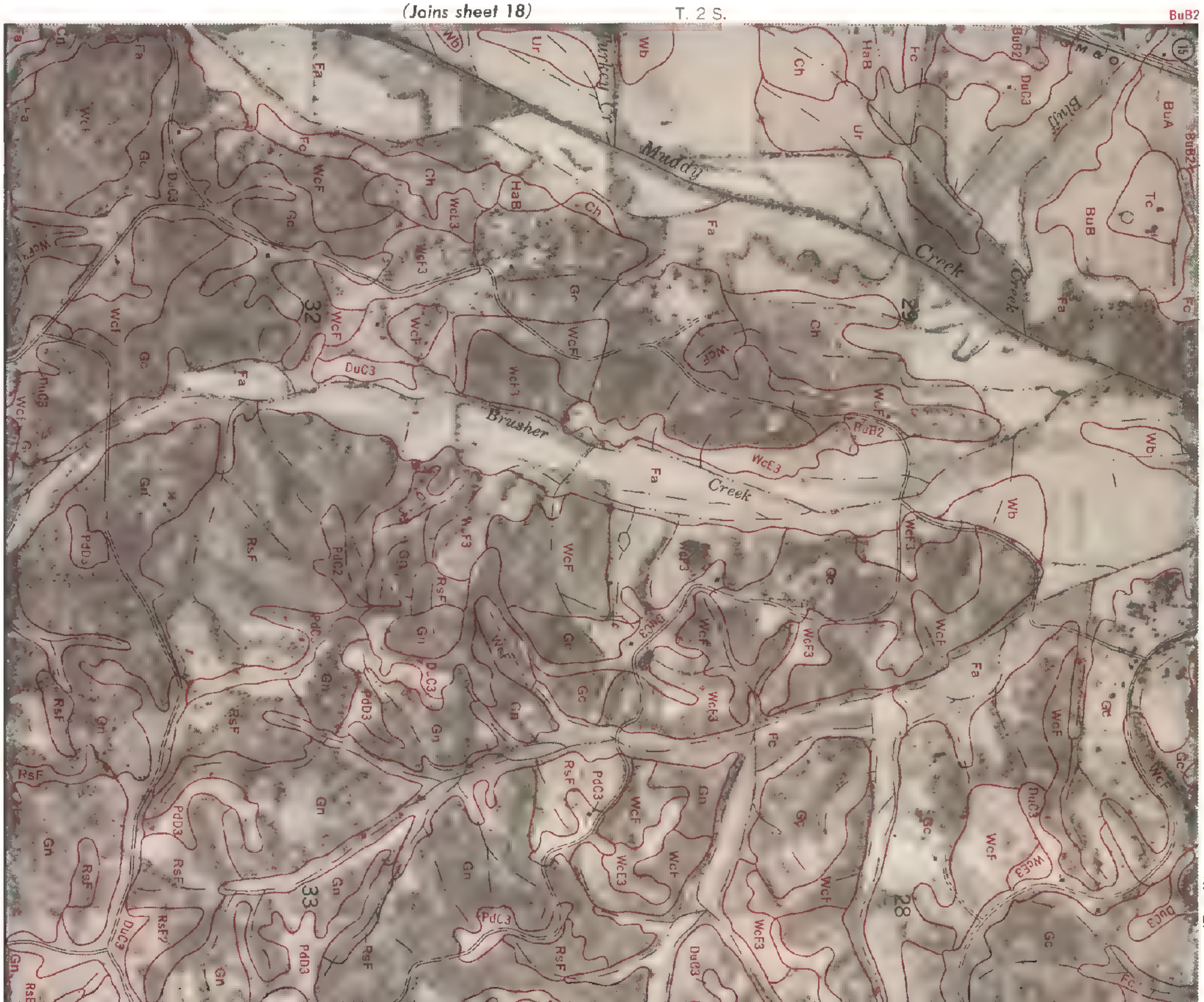
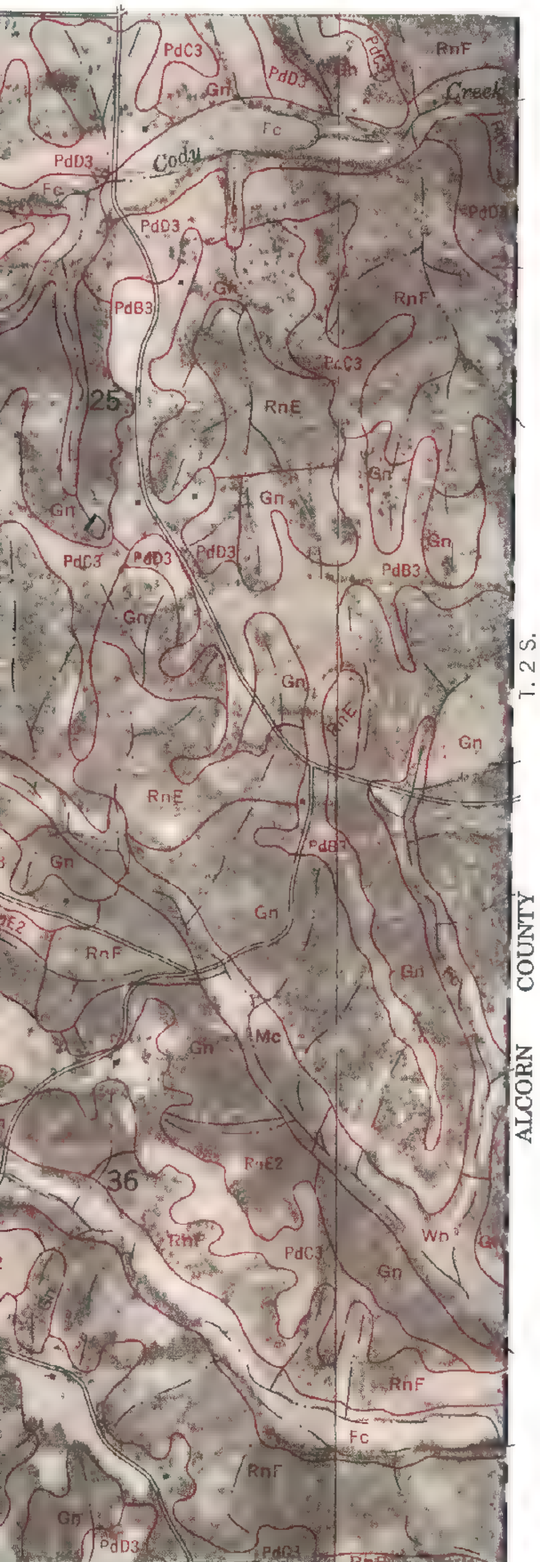
(Joins sheet 18) T. 2 S.

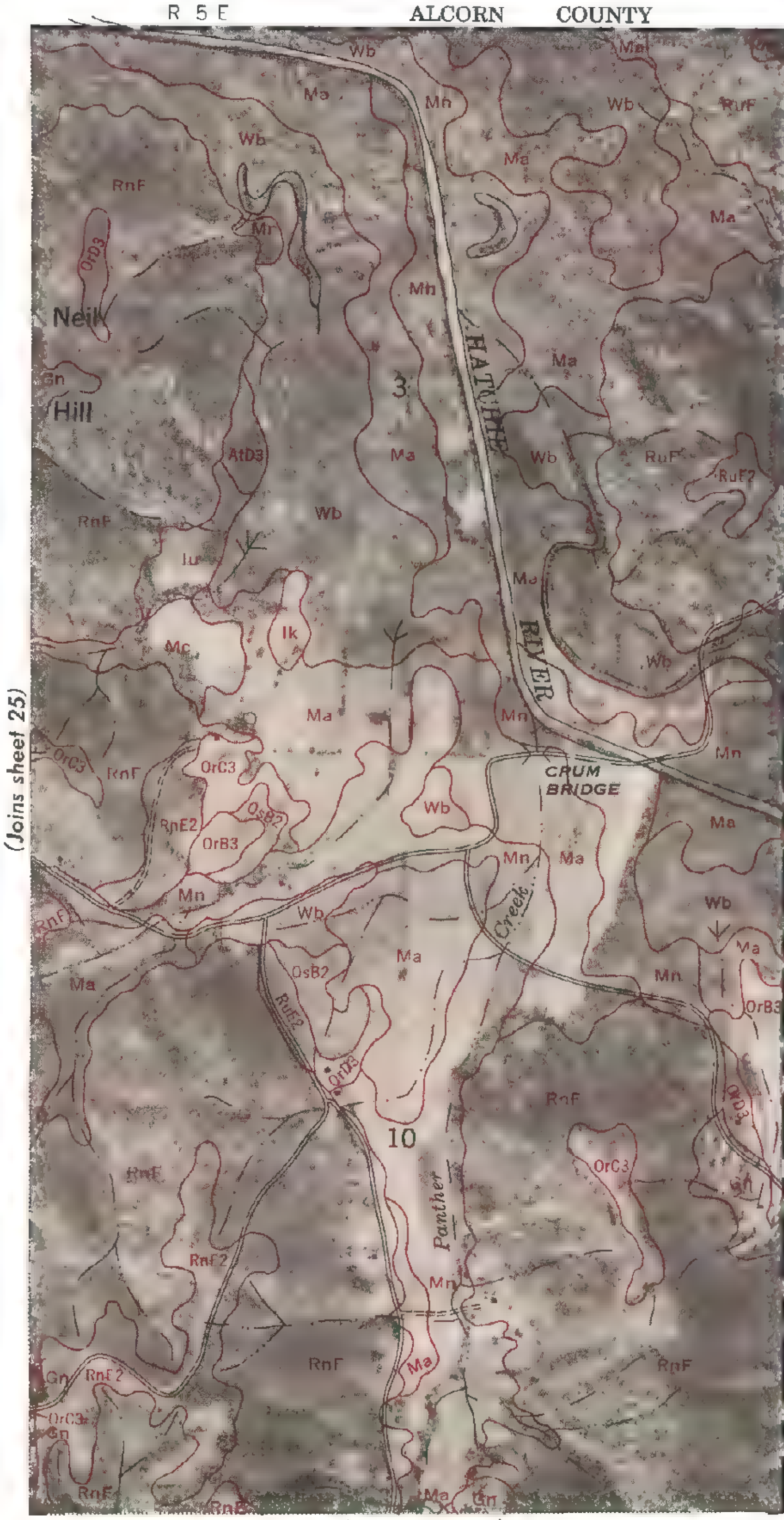


½ Mile

Scale 1:15840

TIPPAH COUNTY, MISSISSIPPI — S





Scale 1:15840
0
3000 Feet

0 ½ Mile Scale 1:15 840

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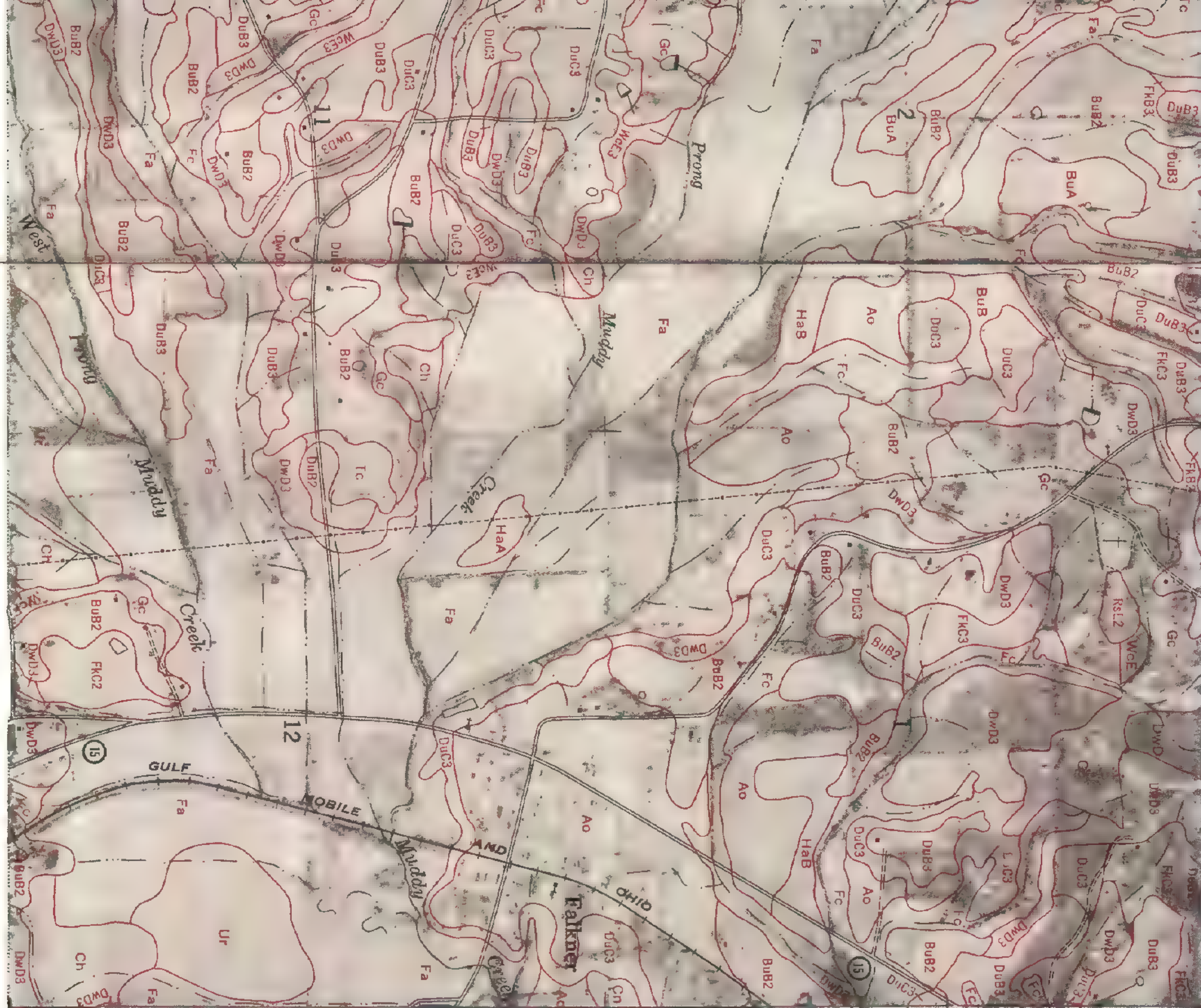
Range, township, and section corners on this map are indefinite.

Scale 1:15840

0

3000 Feet



(Joins sheet 23)

T. 3 S.

(Joins sheet 18) | (Joins sheet 19)

R. 4 E.

T. 3 S.

(Joins sheet 22)

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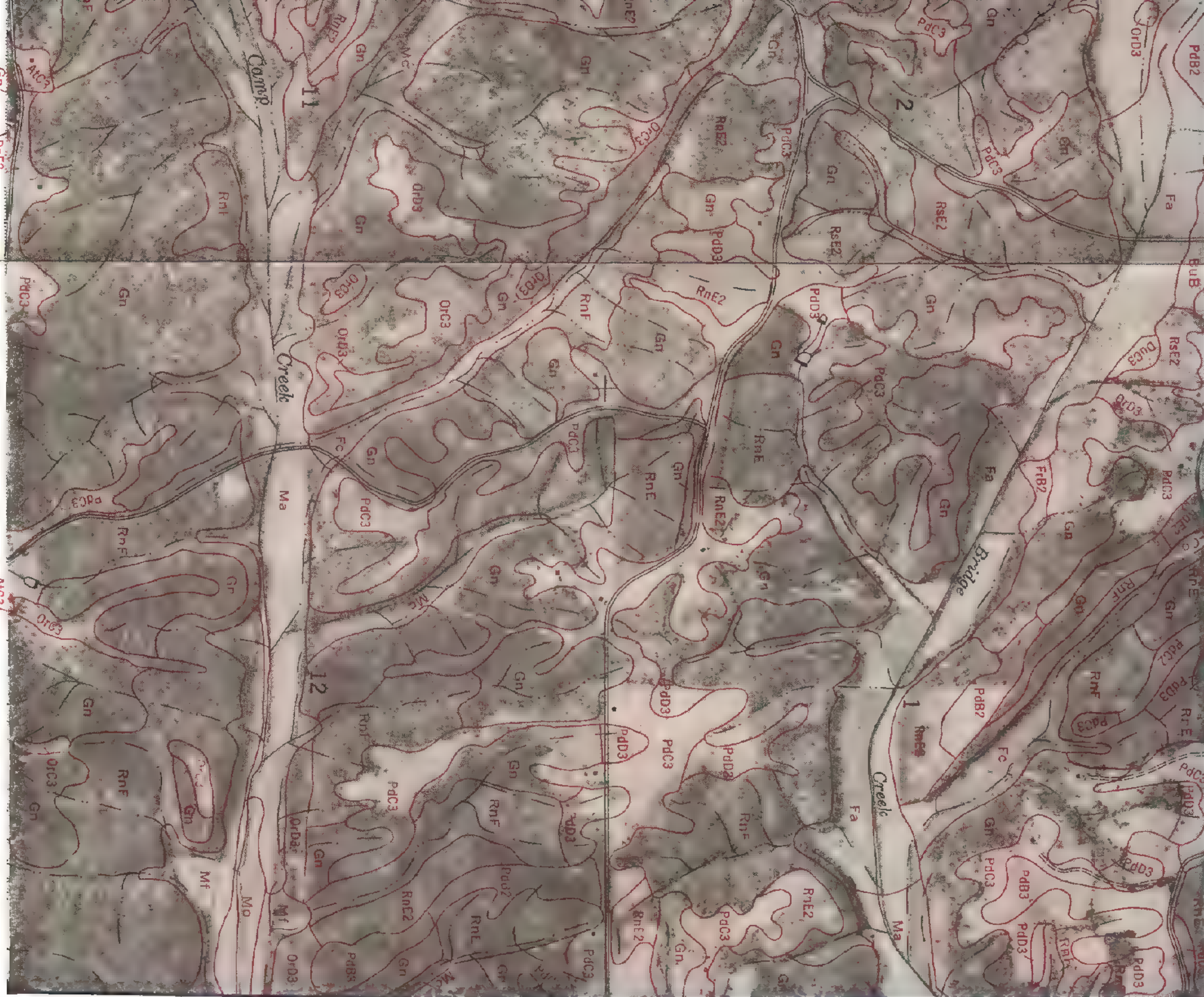
0 ½ Mile Scale 1:15 840 0

Scale 1:15840

0 — 3000 Feet



(Joins sheet 25)

T. 3 S.

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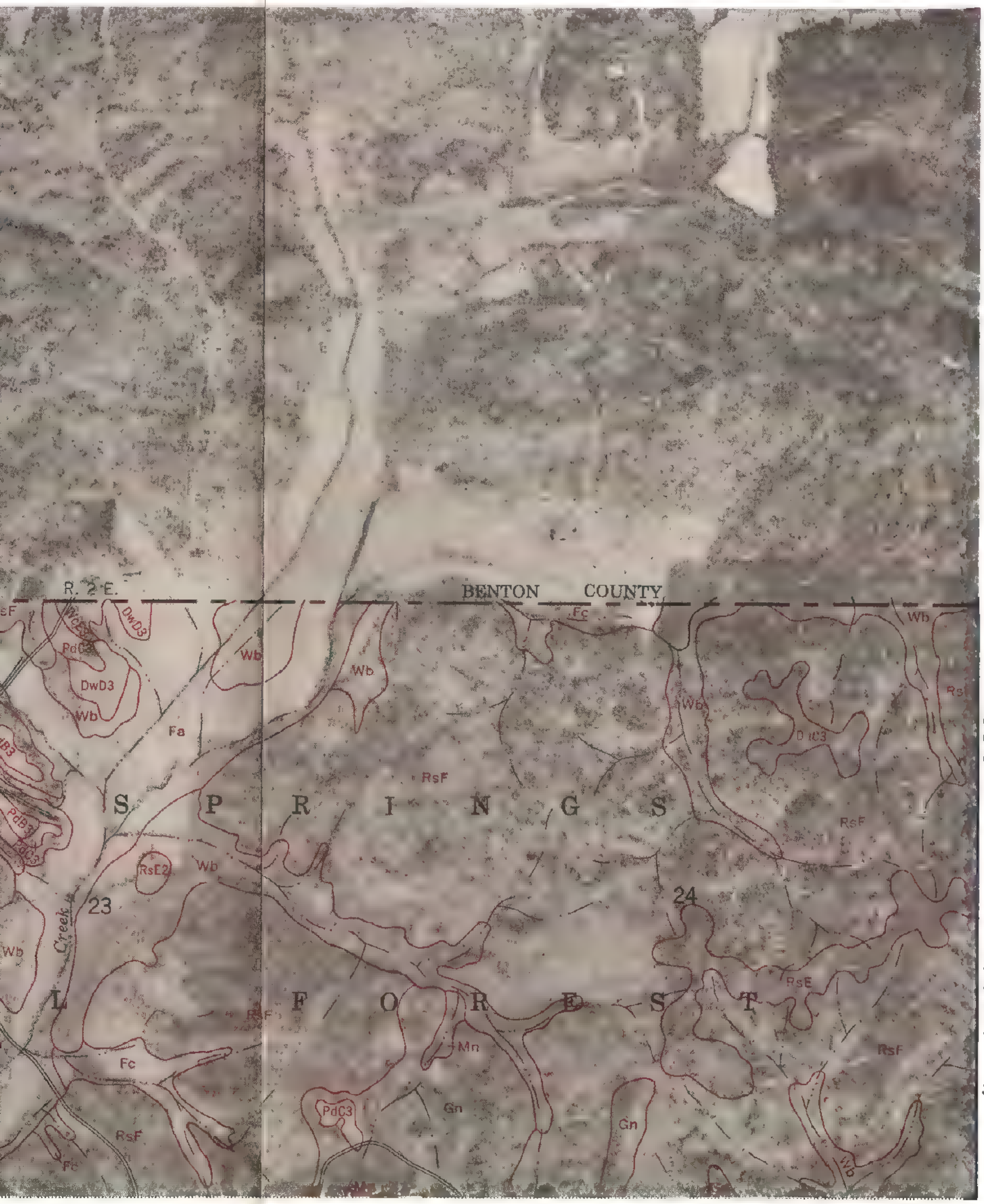
(Joins sheet 24)

T. 3 S.

0
½ Mile
Scale 1:15840

TIPPAH COUNTY, MISSISSIPPI — S



T. 3 S.

(Joins sheet 27)

Scale 1:15 840 0 3 000 Feet

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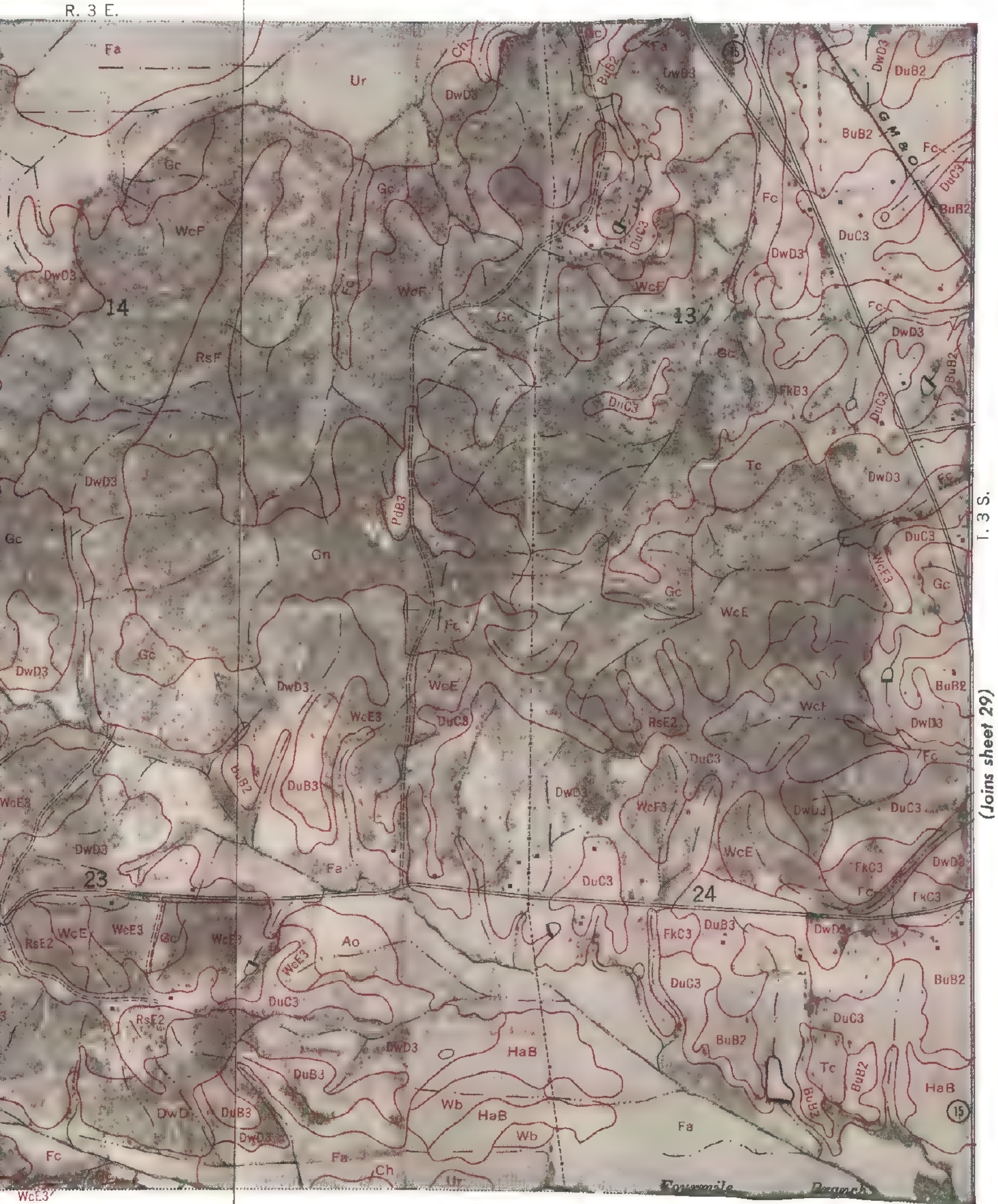

Scale 1:15 840 0 3000 Feet

TIPPAH COUNTY, MISSISSIPPI — SH

0 ¼ Mile Scale 1:15840

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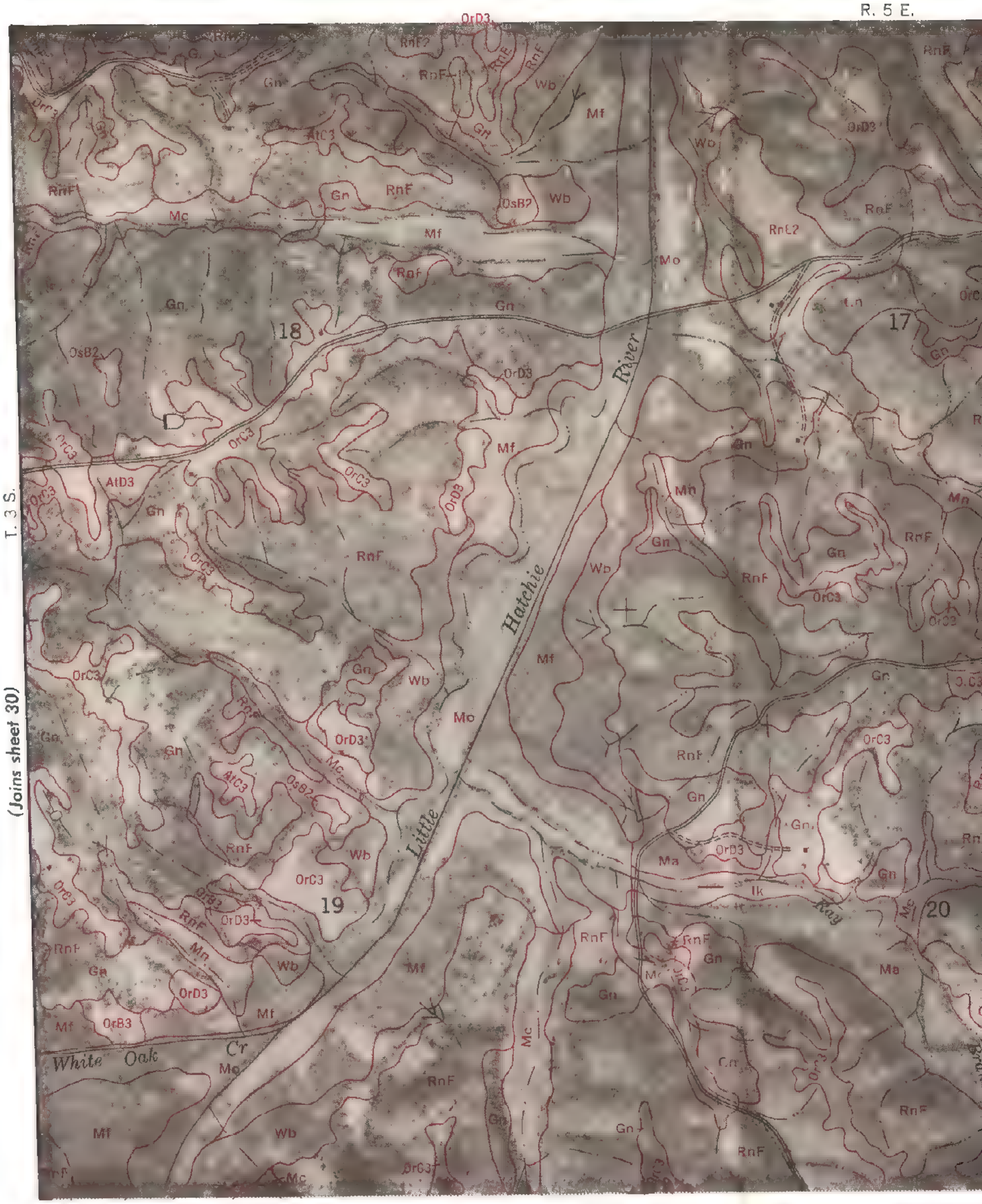
MISSISSIPPI — SHEET NUMBER 30

Scale 1:15840 0 3000 Feet

R. 5 E.

T. 3 S.

(Joins sheet 30)



0 ½ Mile Scale 1:15 840 0

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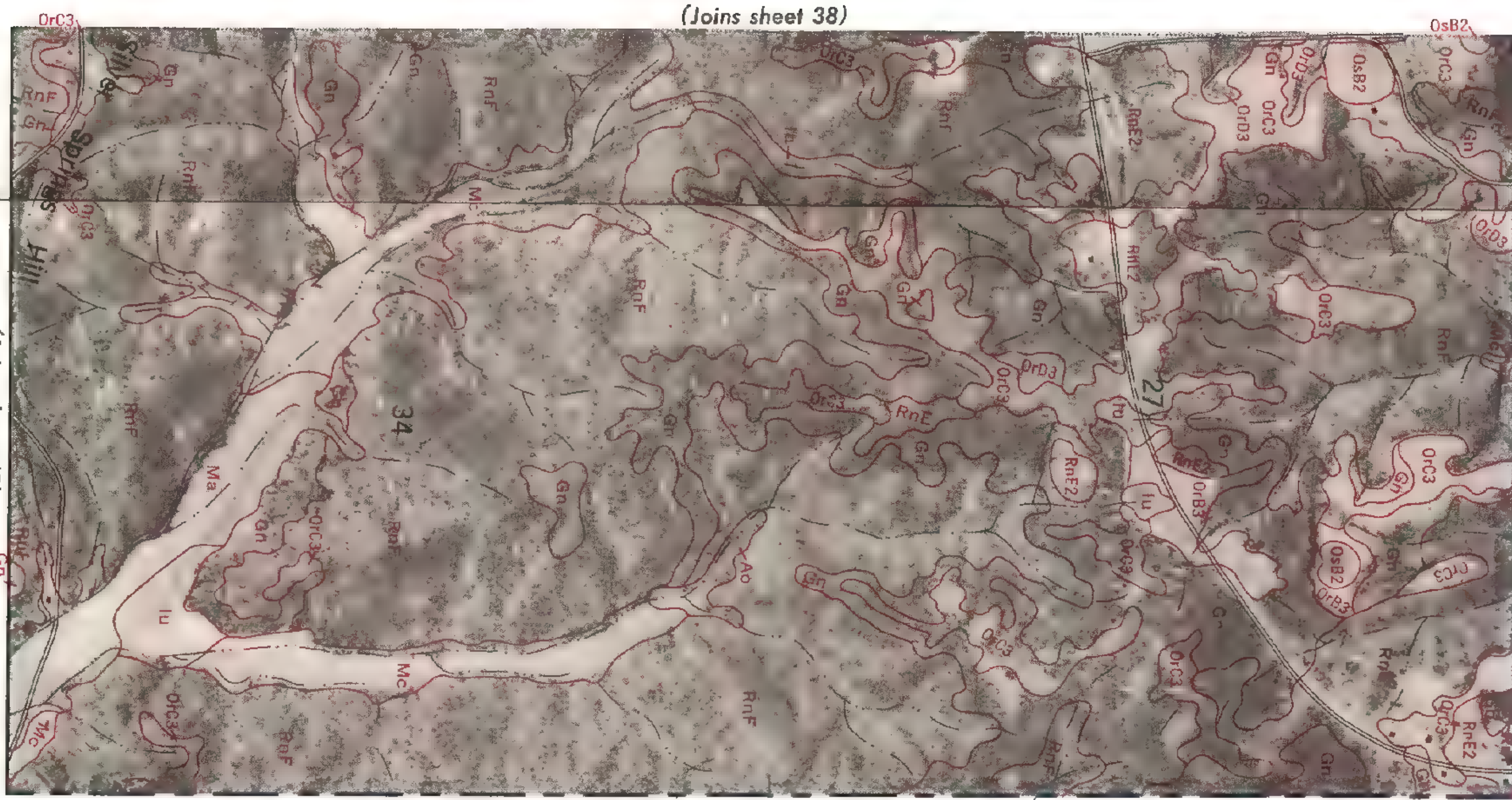

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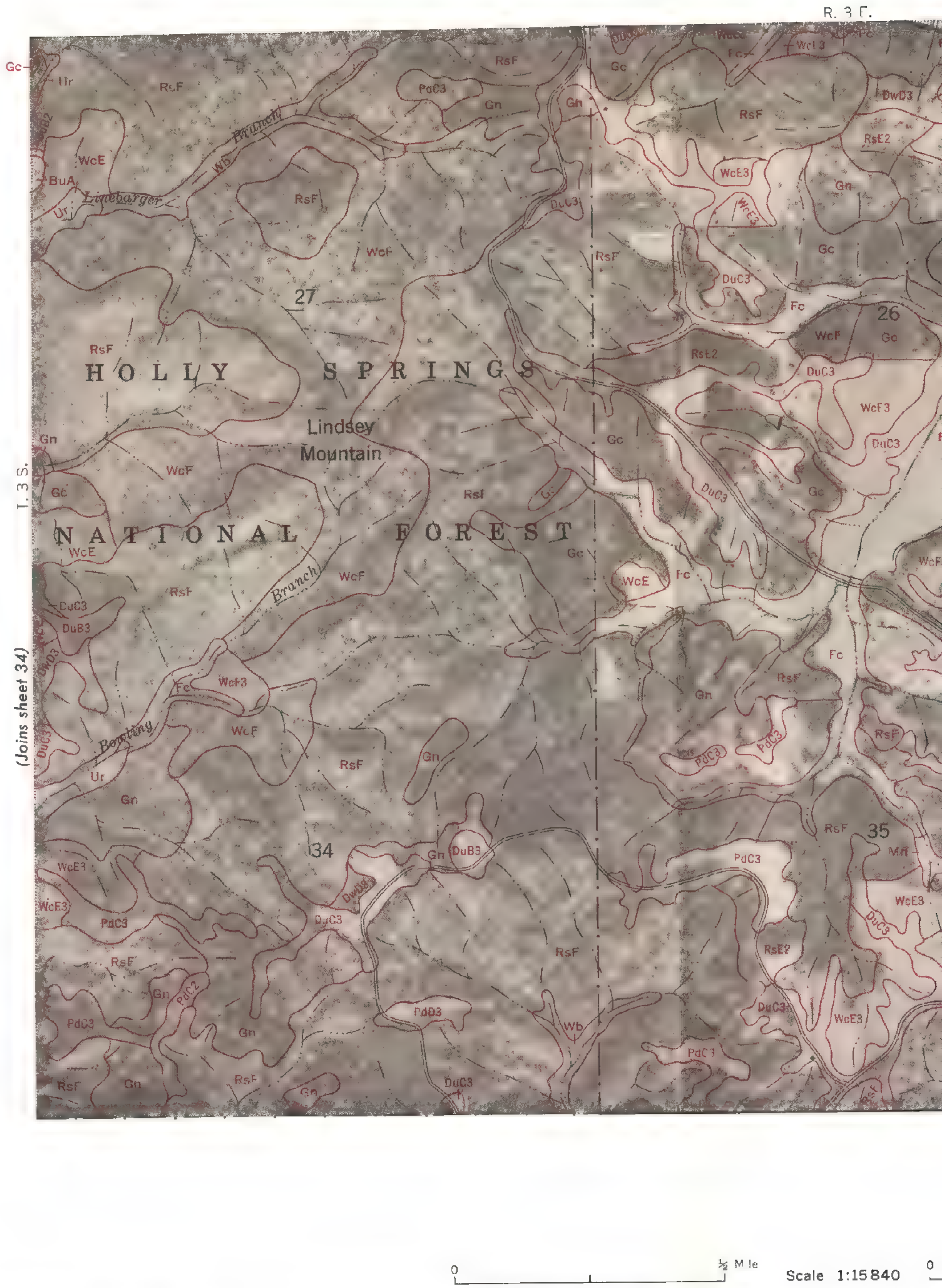
R. 3 E.

T. 3 S.

(Joins sheet 35)

Scale 1:15840 0 3000 Feet



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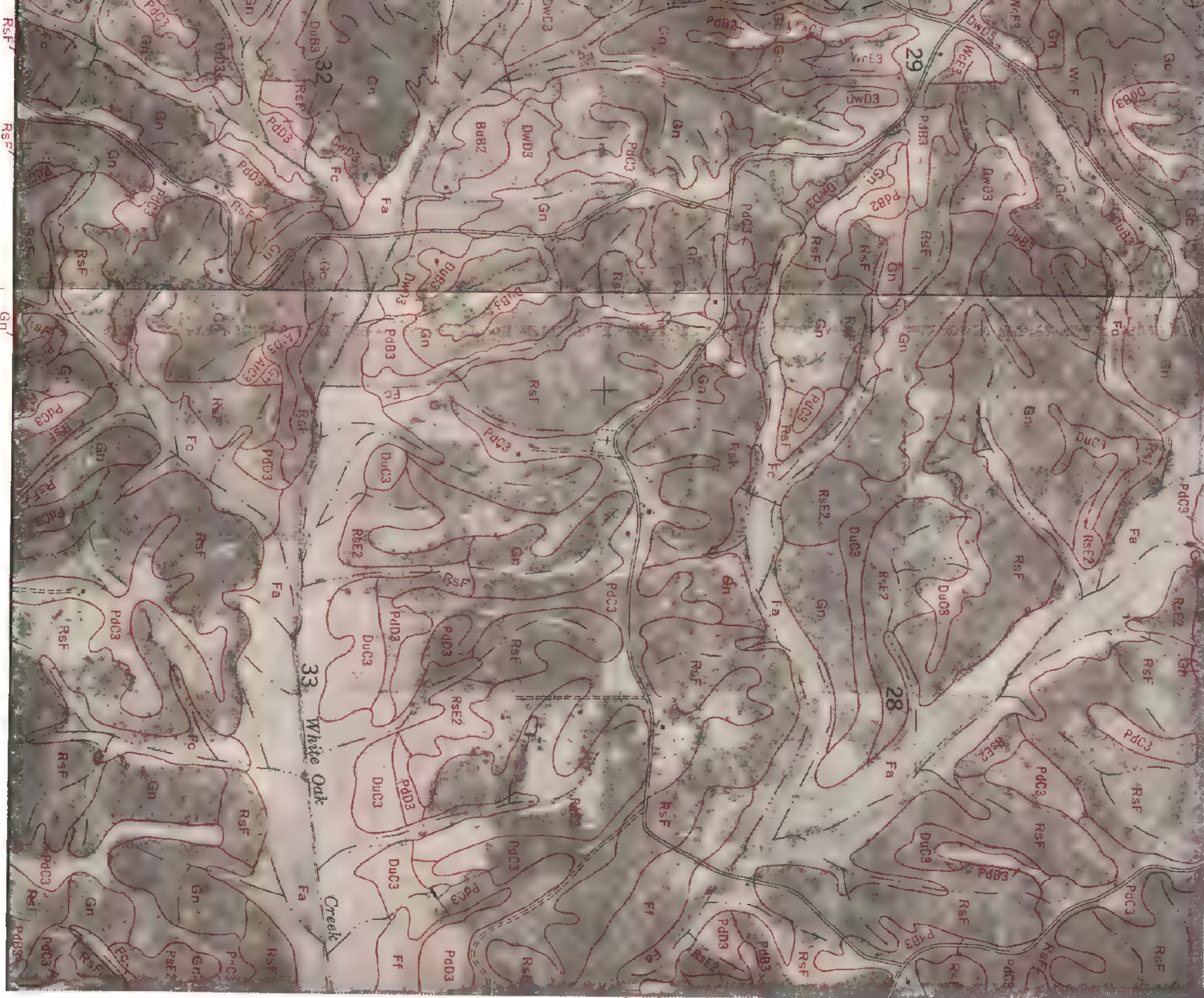
Range, township, and section corners on this map are indefinite.

ale 1:15840

0

3 000 Feet

R. 4 E.



DuC3

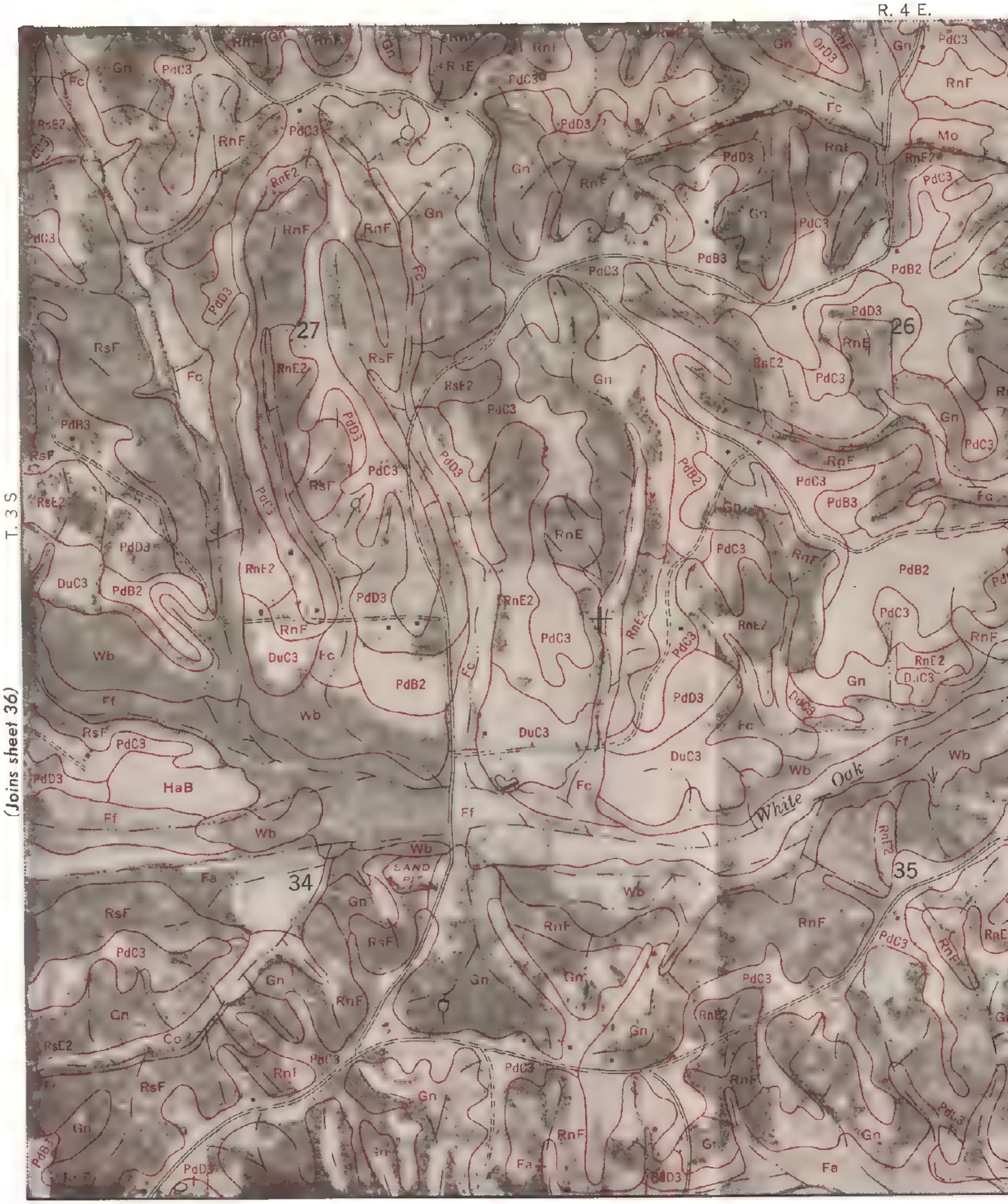
(Joins sheet 37)

T. 3 S.

R. 4 E.

T. 3 S

(Joins sheet 36)



0 ½ Mile Scale 1:15840 0

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Range, township, and section corners on this map are indefinite.

R. 5 E.

T. 3 S.

(Joins inset, sheet 32)

Scale 1:15 840 0 3000 Feet

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Range, township, and section corners on this map are indefinite.

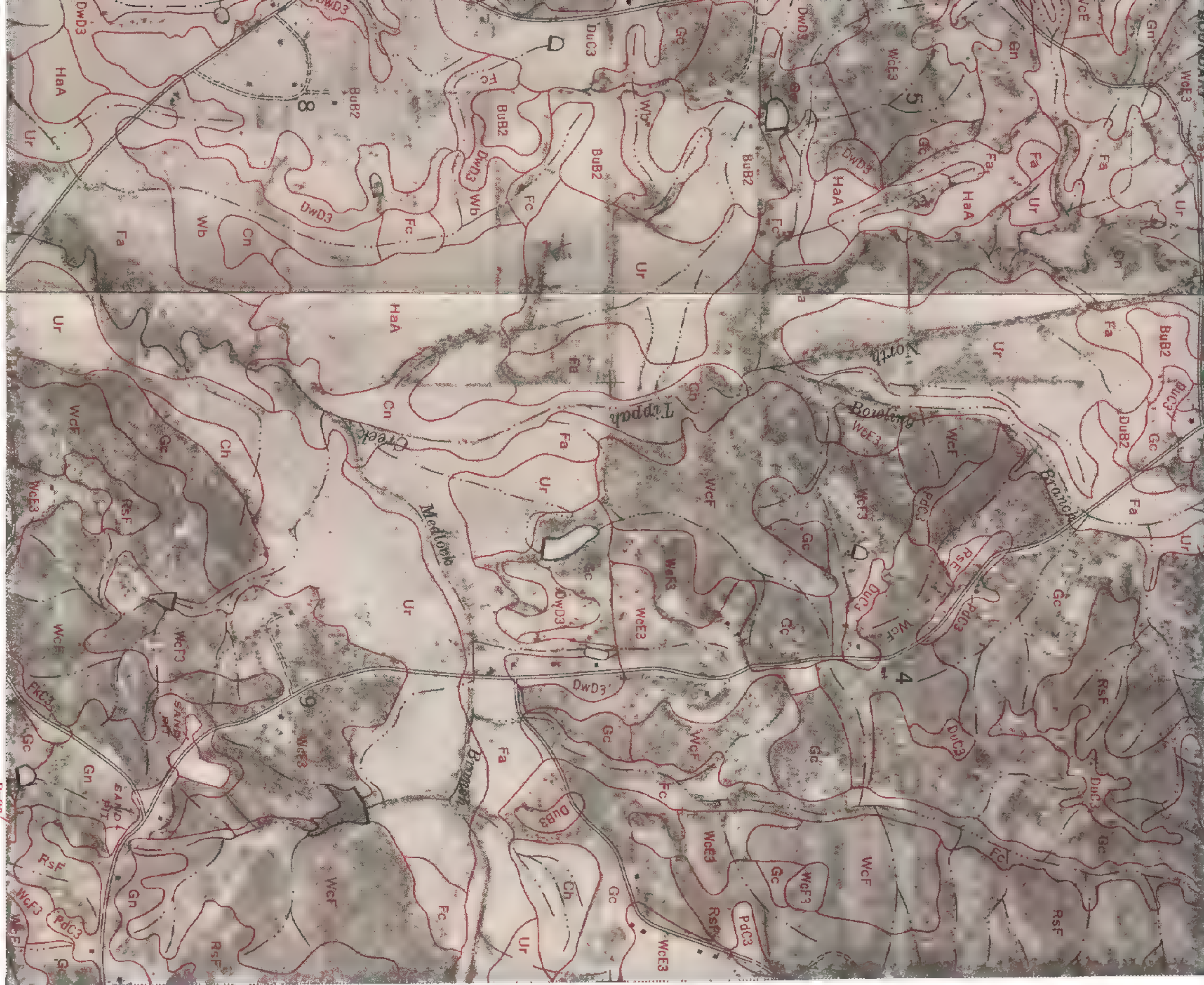
ISSISSIPPI — SHEET NUMBER 40

cale 1:15840

0

3000 Feet

R. 3 E.



(Joins sheet 41)

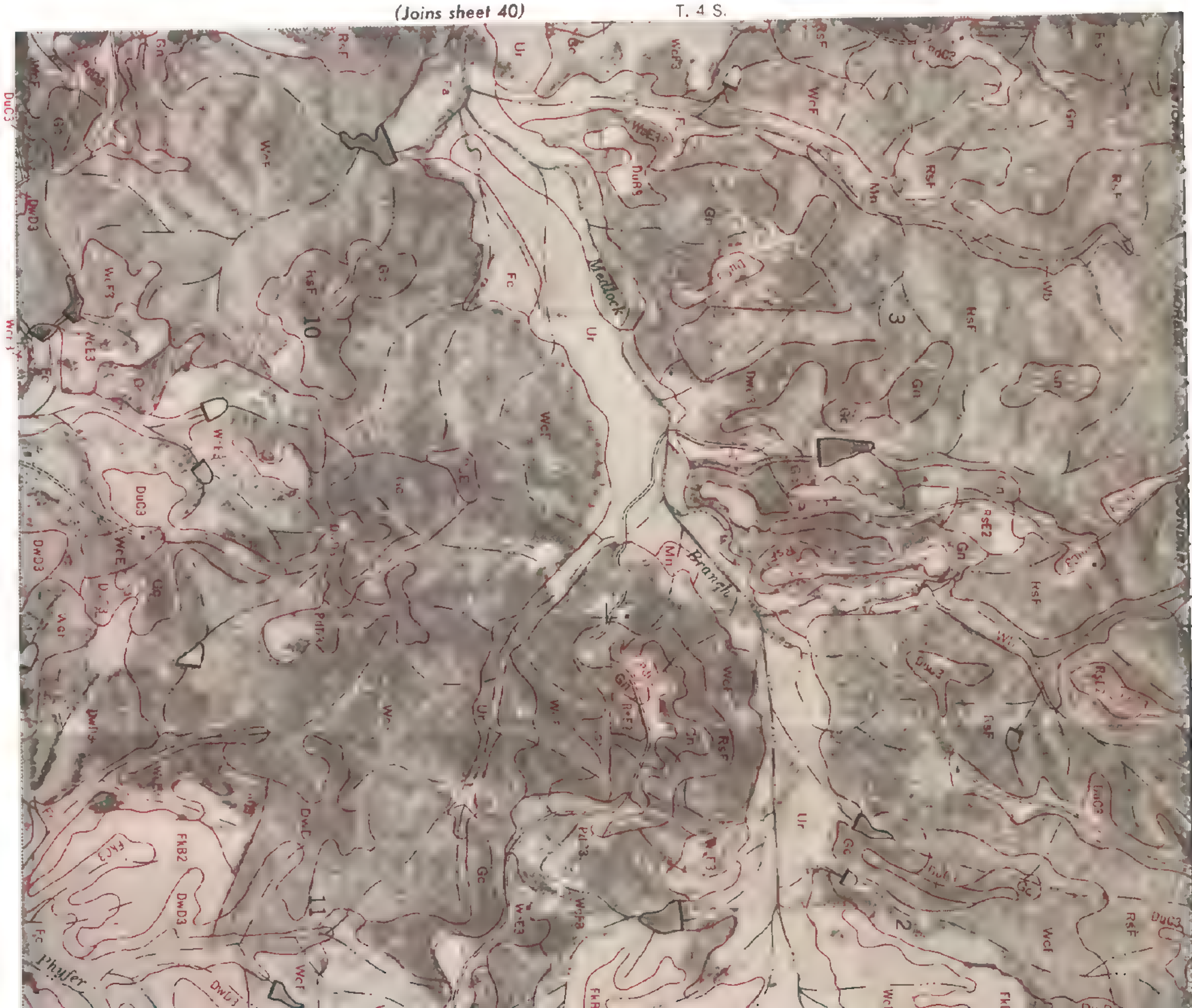
T. 4 S.

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

(Joins sheet 40)

T. 4 S.



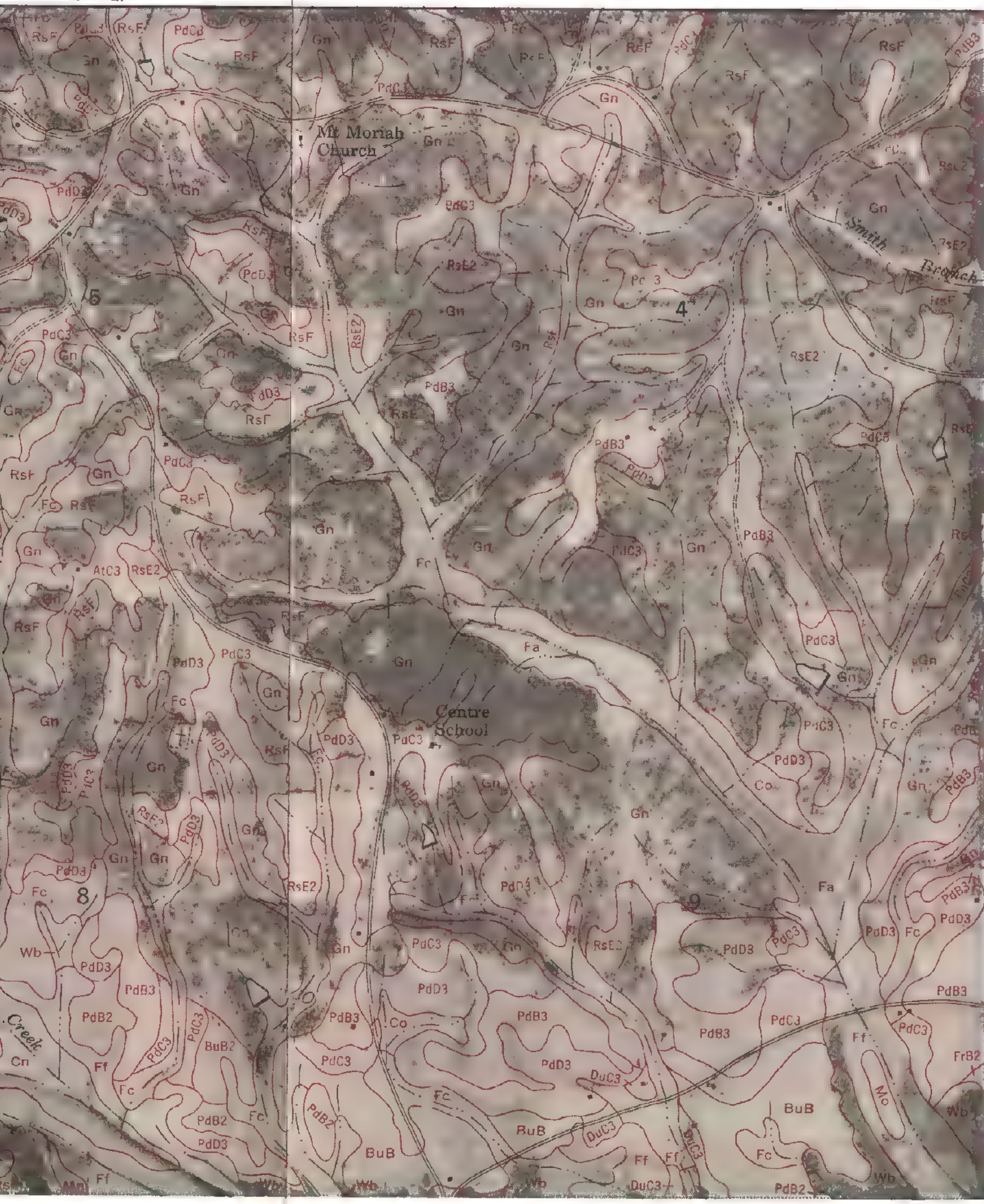
TIPPAH COUNTY, MISSISSIPPI — SH

Scale 1:15840

0

½ Mile

R 4 E.



T 4 S.

(Joins sheet 43)

Scale 1:15 840 0 3000 Feet

R 4 E.

T. 4 S.

(Joins sheet 42)

0 ½ Mile Scale 1:15840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

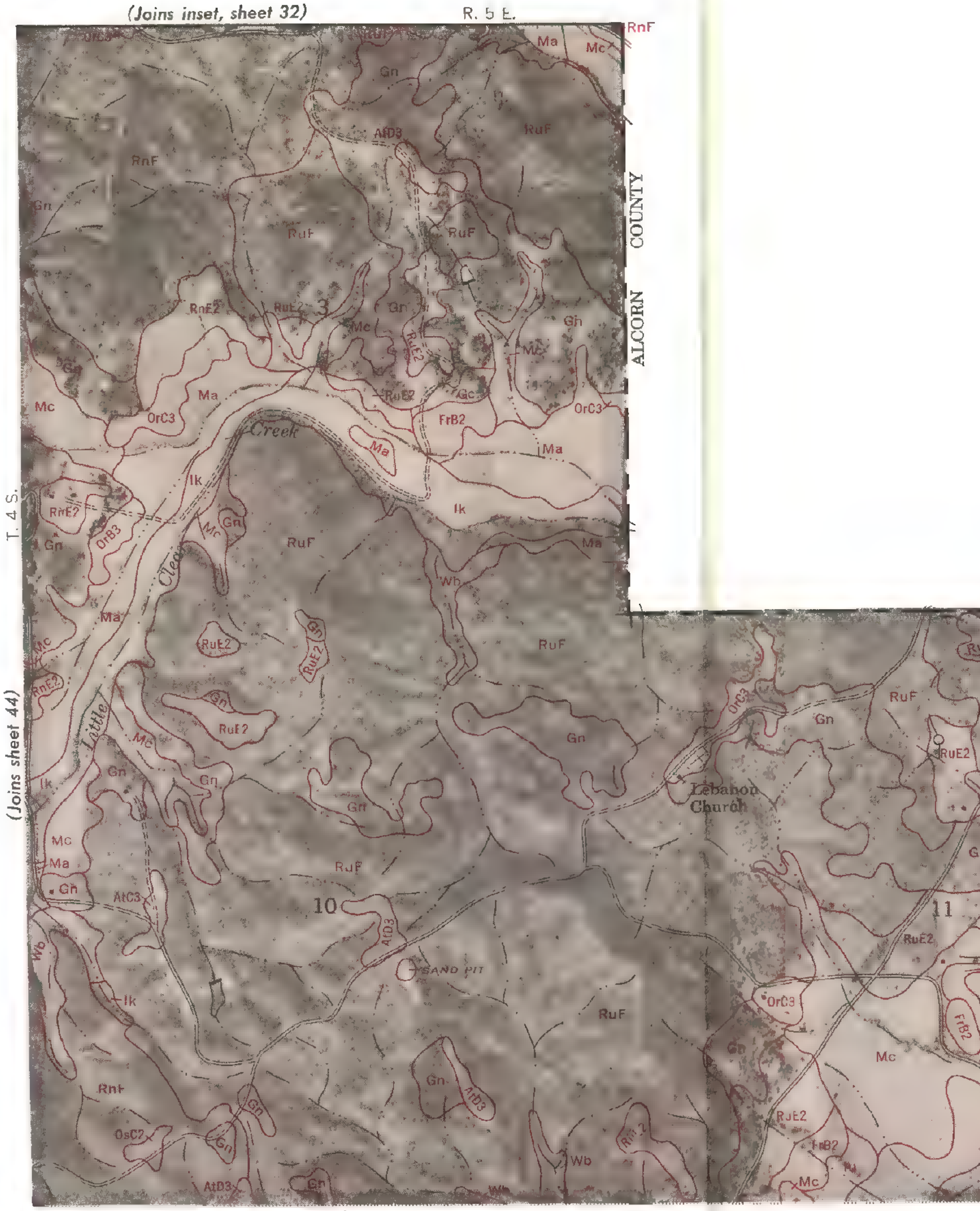
Range, township, and section corners on this map are indefinite.

ale 1:15840

0 3000 Feet

R. 5 E.

(Joins sheet 45) T. 4 S.



0 ½ Mile Scale 1:15 840

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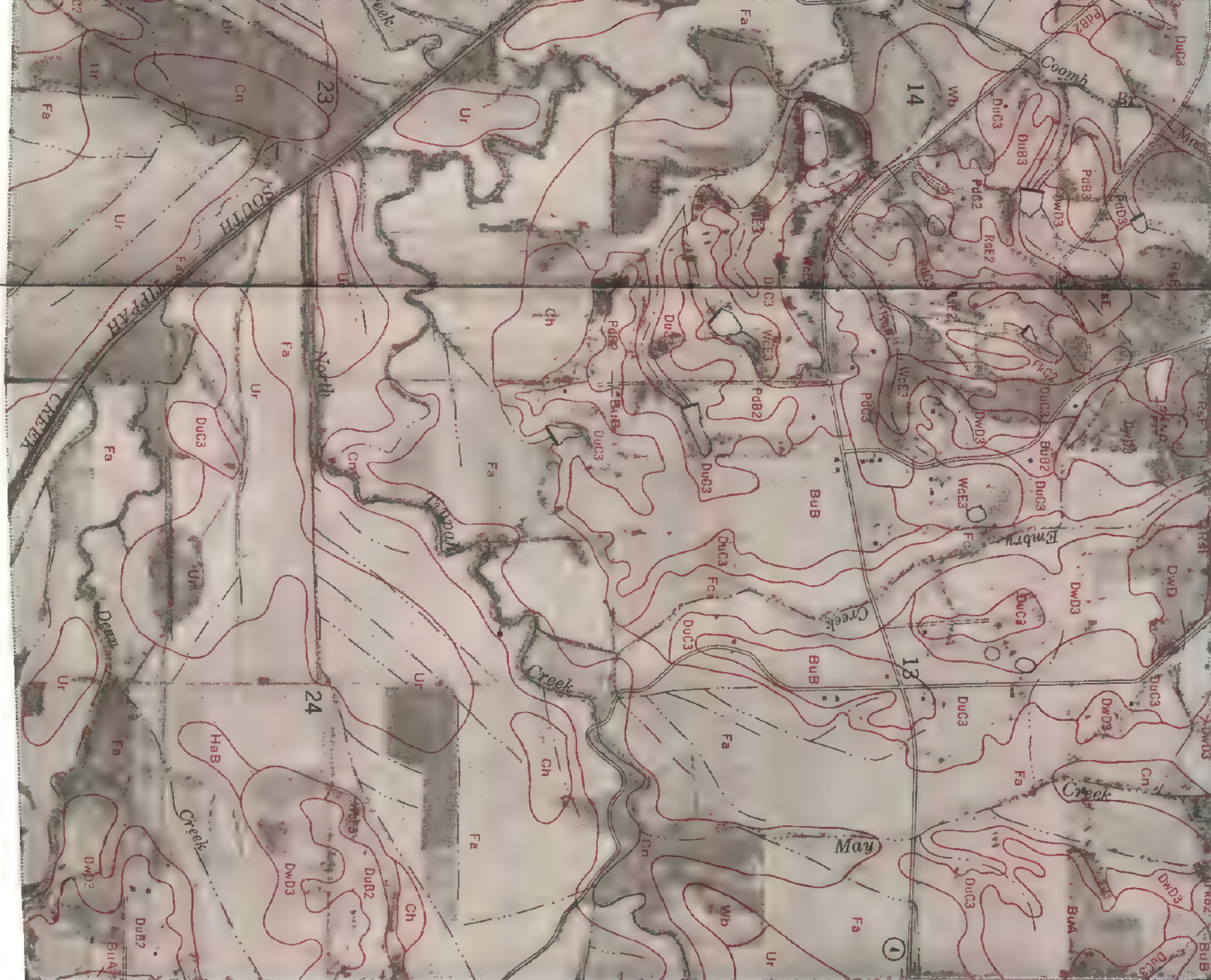
R. 2 E.



ale 1:15840

0

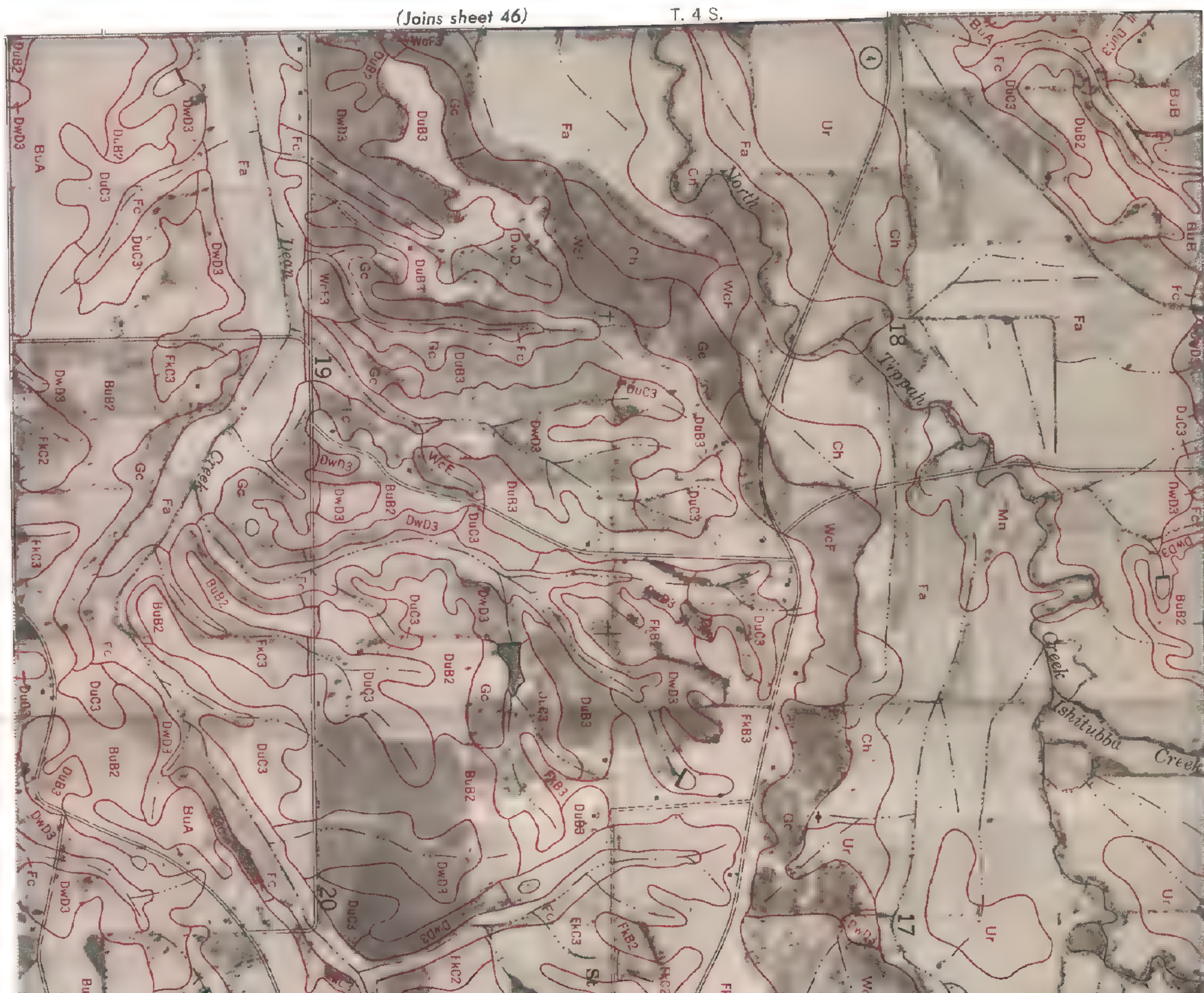
3000 Feet

(Joins sheet 47)

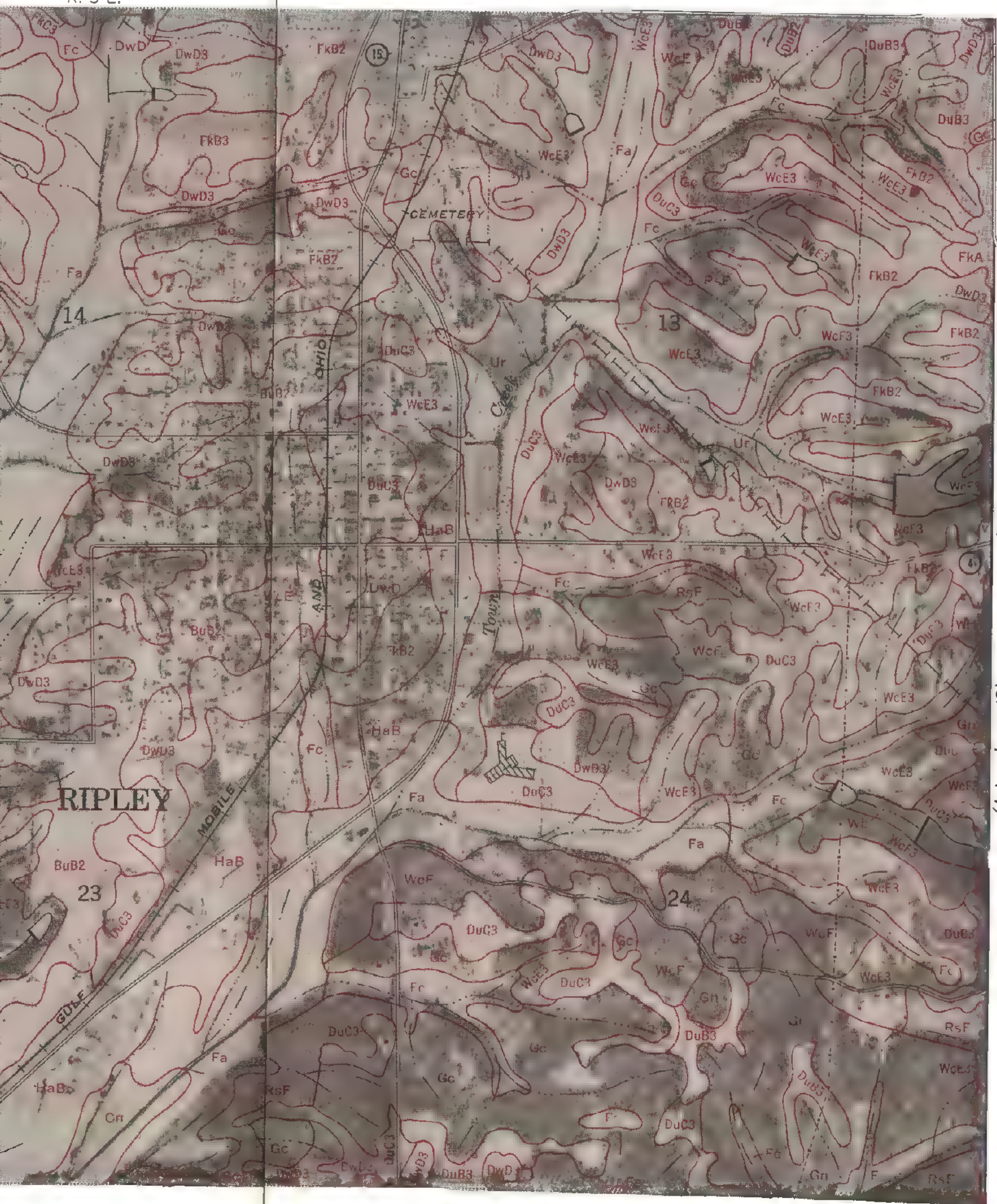
T. 4 S.

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station

Range, township, and section corners on this map are indefinite.



R. 3 E.



T. 4 S.

(Joins sheet 49)

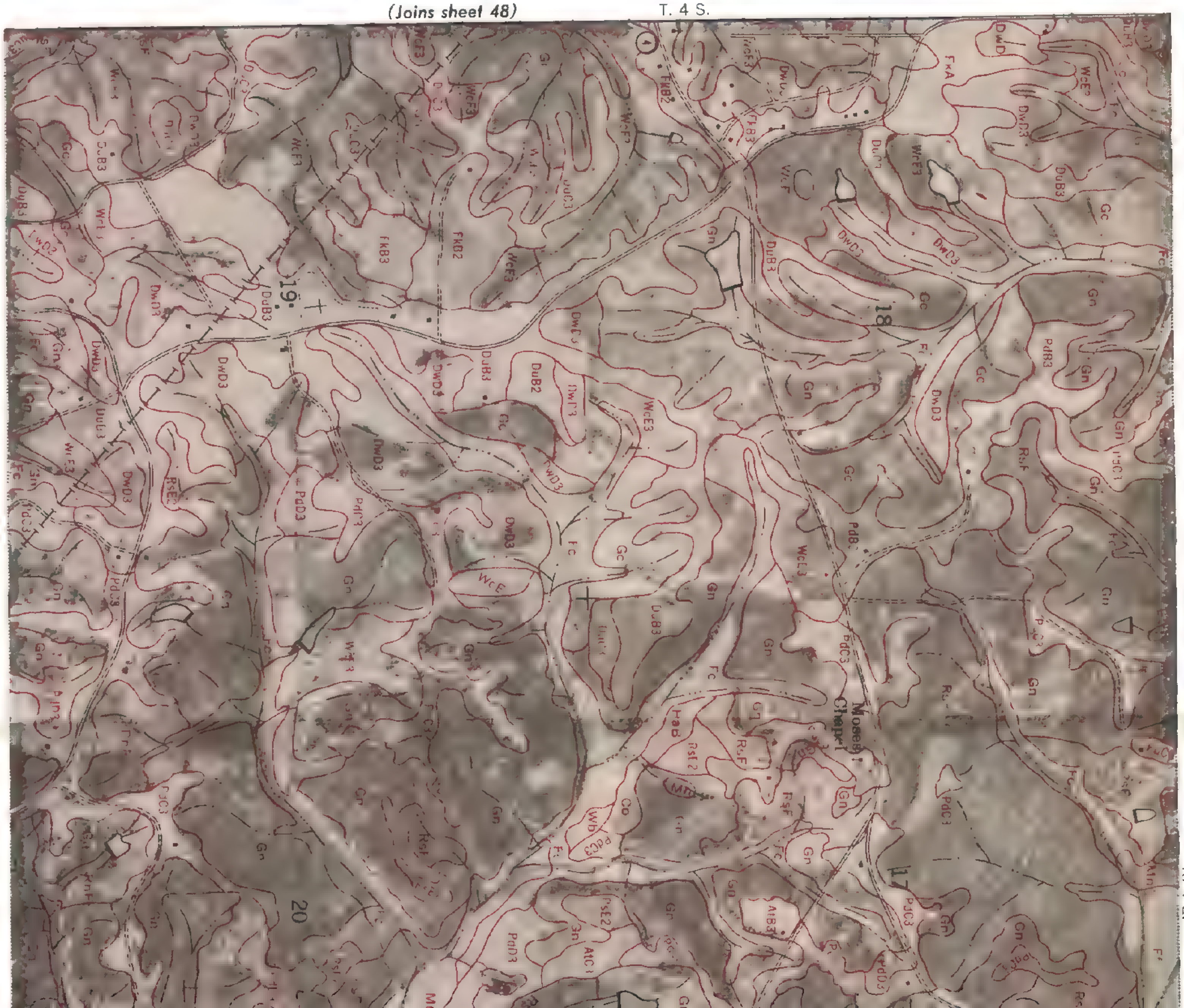
Scale 1:15840 0 3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

(Joins sheet 48)

T. 4 S.



R. 4 E.

0 ½ Mile

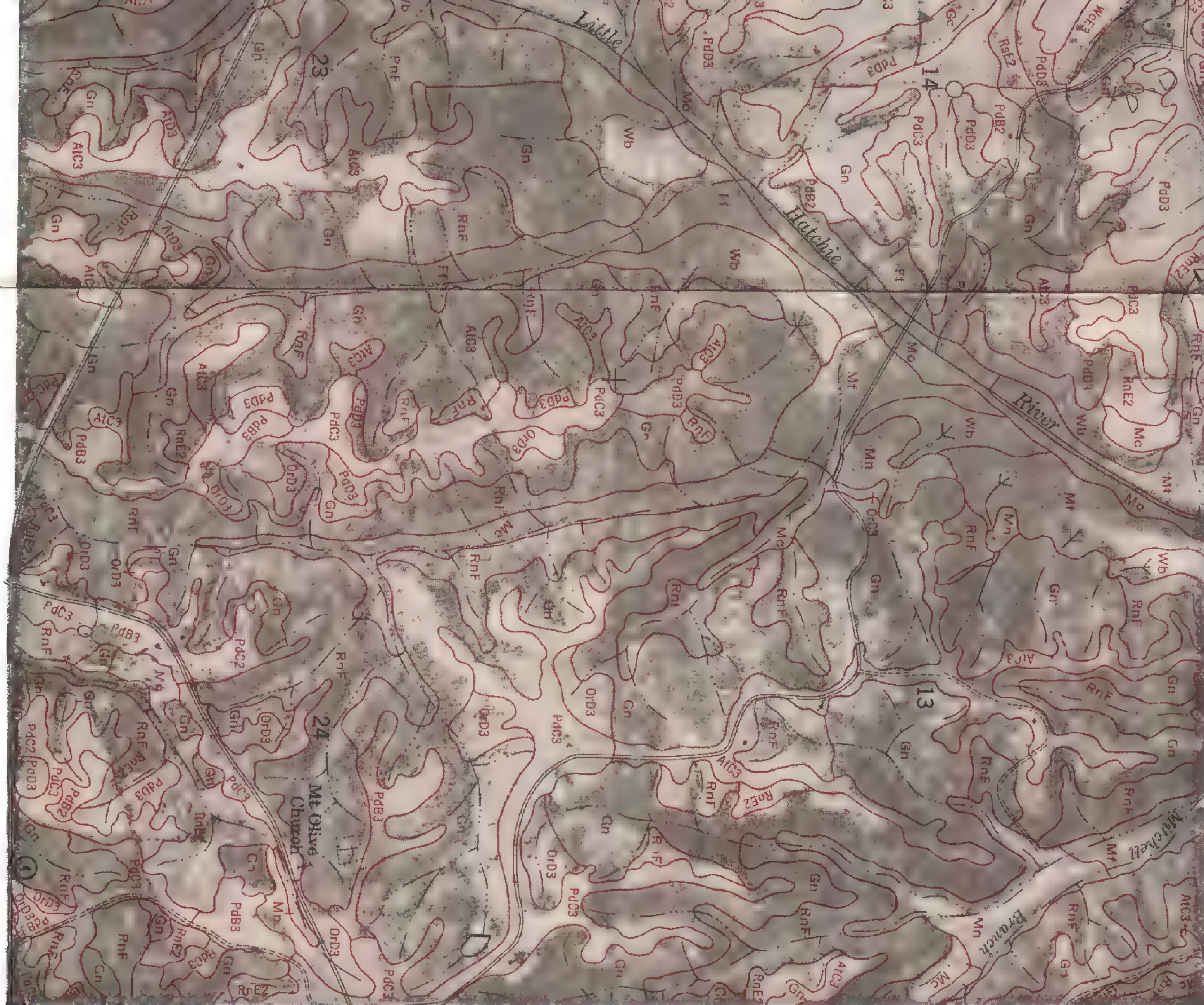
Scale 1:15840

TIPPAH COUNTY, MISSISSIPPI — SH

Scale 1:15840

0

3000 Feet



(Joins sheet 51)

T. 4 S.

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

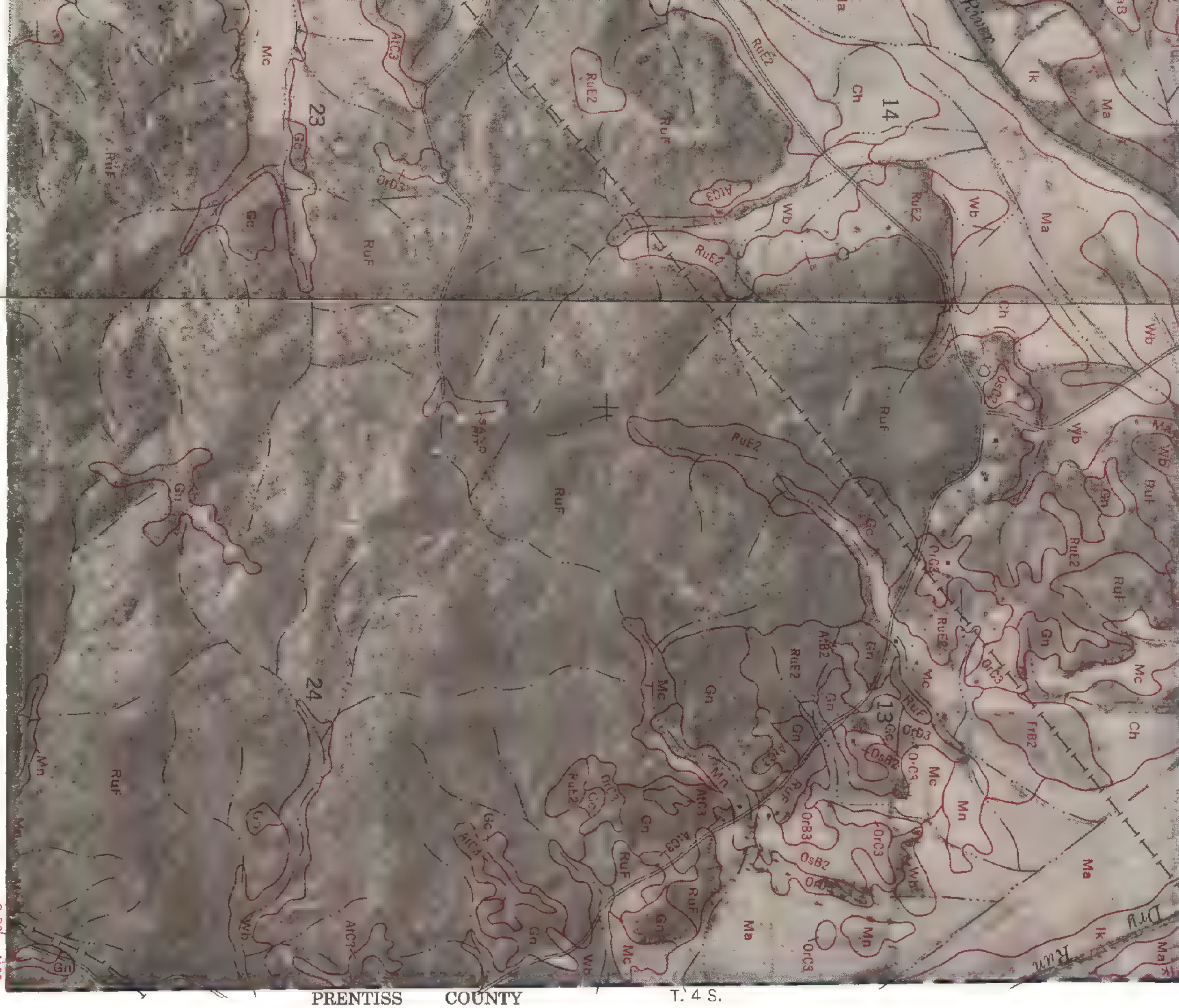
Range, township, and section corners on this map are indefinite.

0 ½ Mile Scale 1:15 840 0

Scale 1:15840

0

3000 Feet

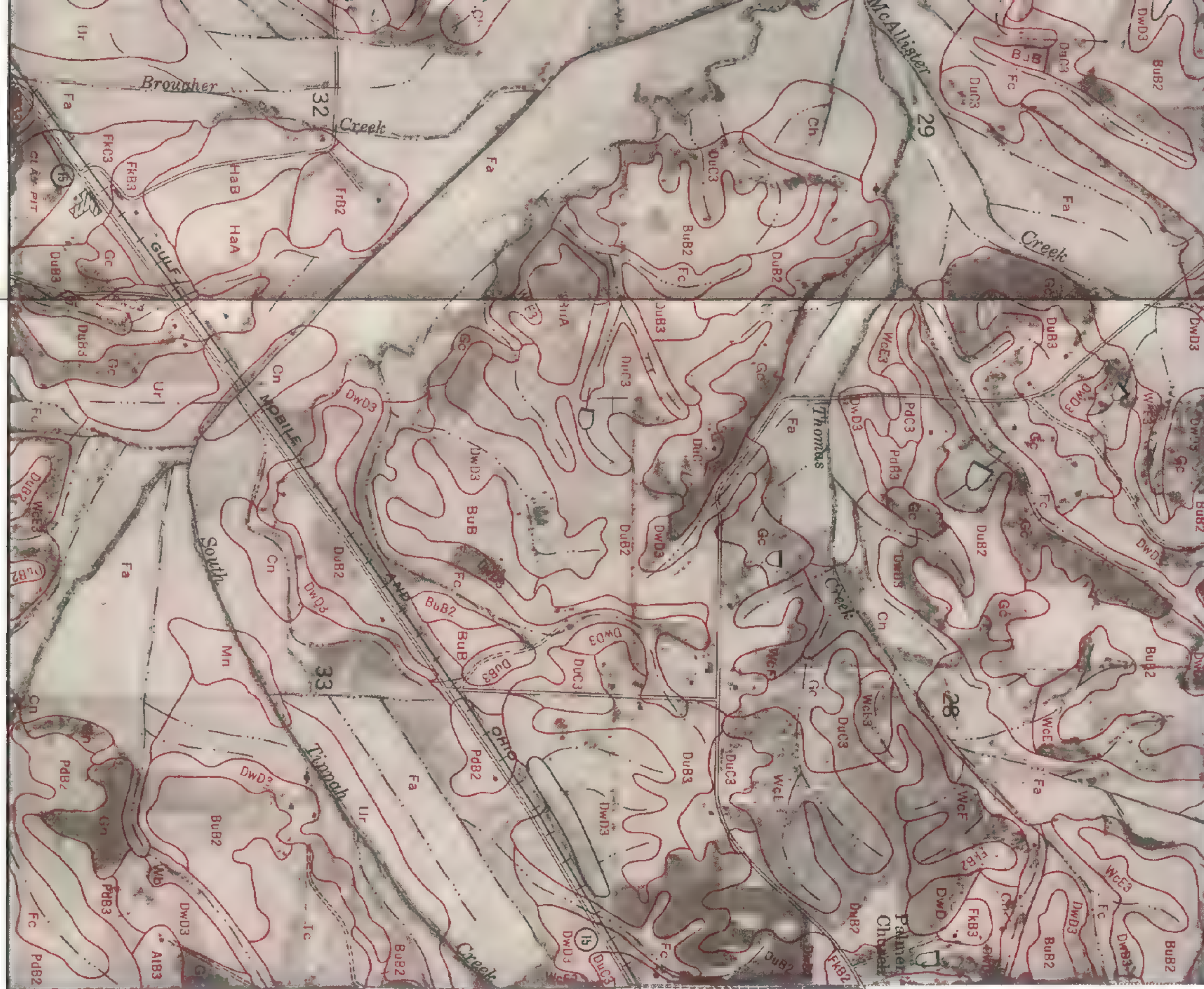


This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

Scale 1:15840
0 ½ Mile

R. 3 E.



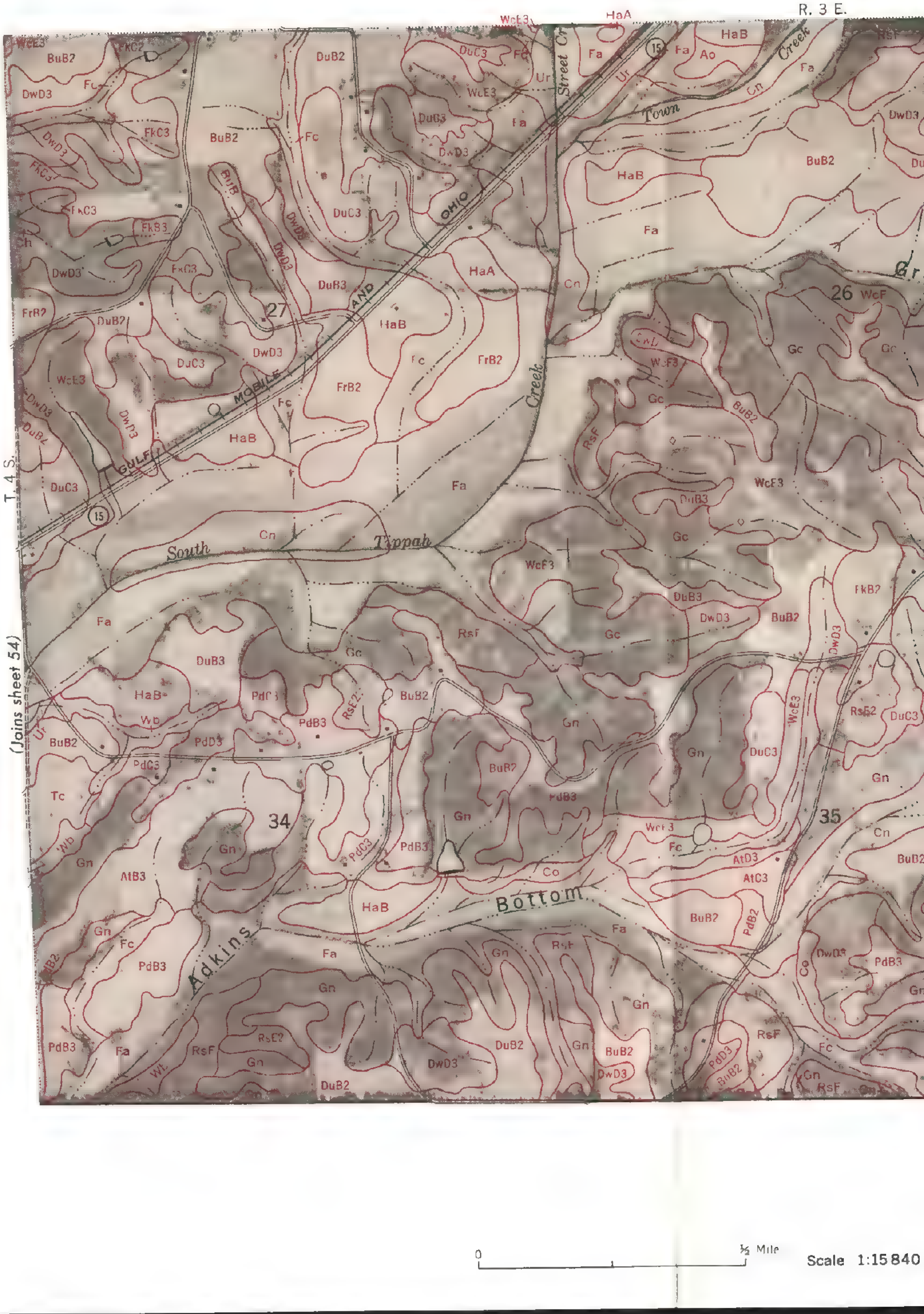
(Joins sheet 55)

T. 4 S.

Scale 1:15840

0

3000 Feet

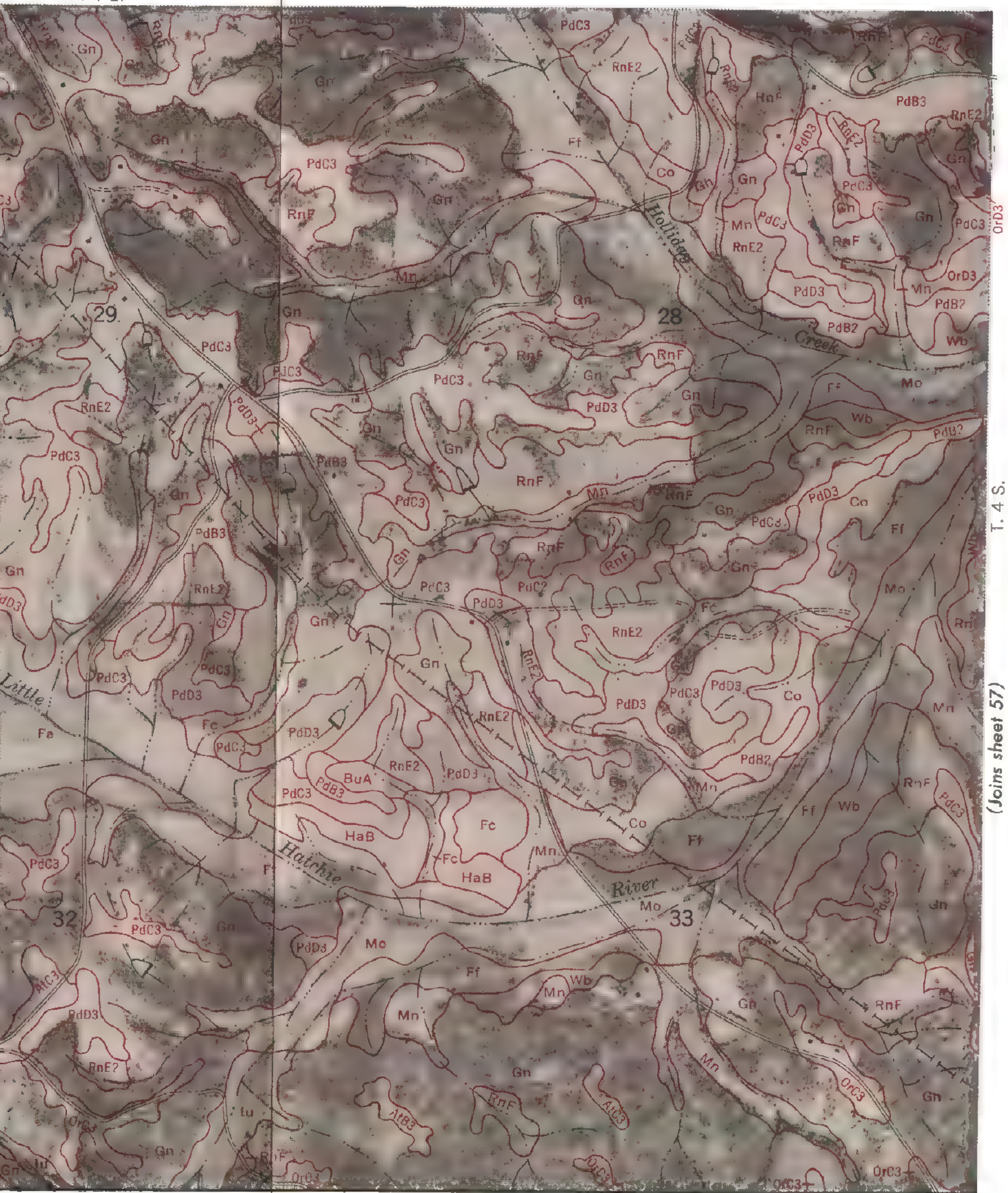


This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

MISSISSIPPI — SHEET NUMBER 56

R. 4 E.



T. 4 S.

(Joins sheet 57)

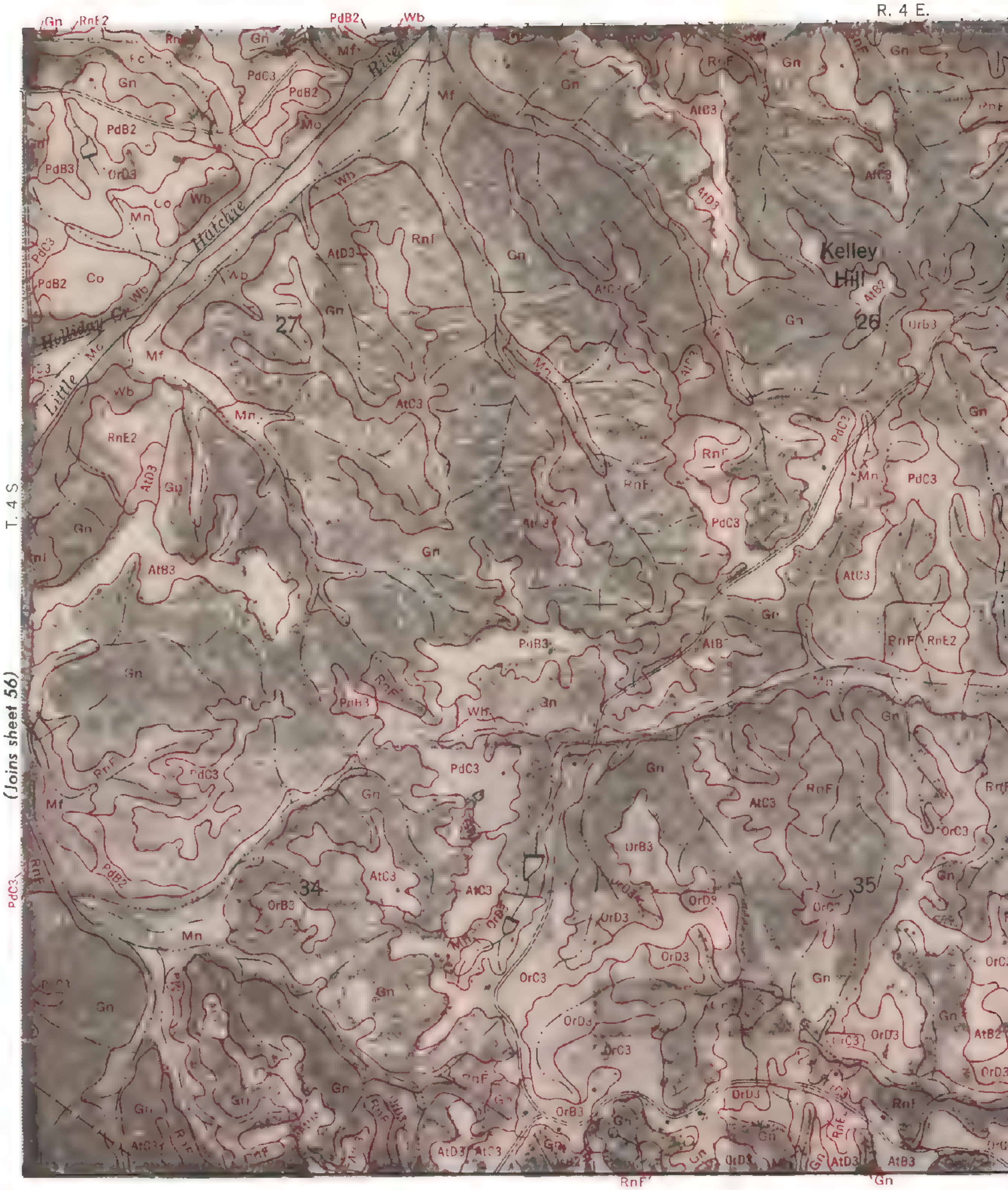
Scale 1:15840

0 3000 Feet

R. 4 E.

T. 4 S.

(Joins sheet 56)



This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

0 ½ Mile

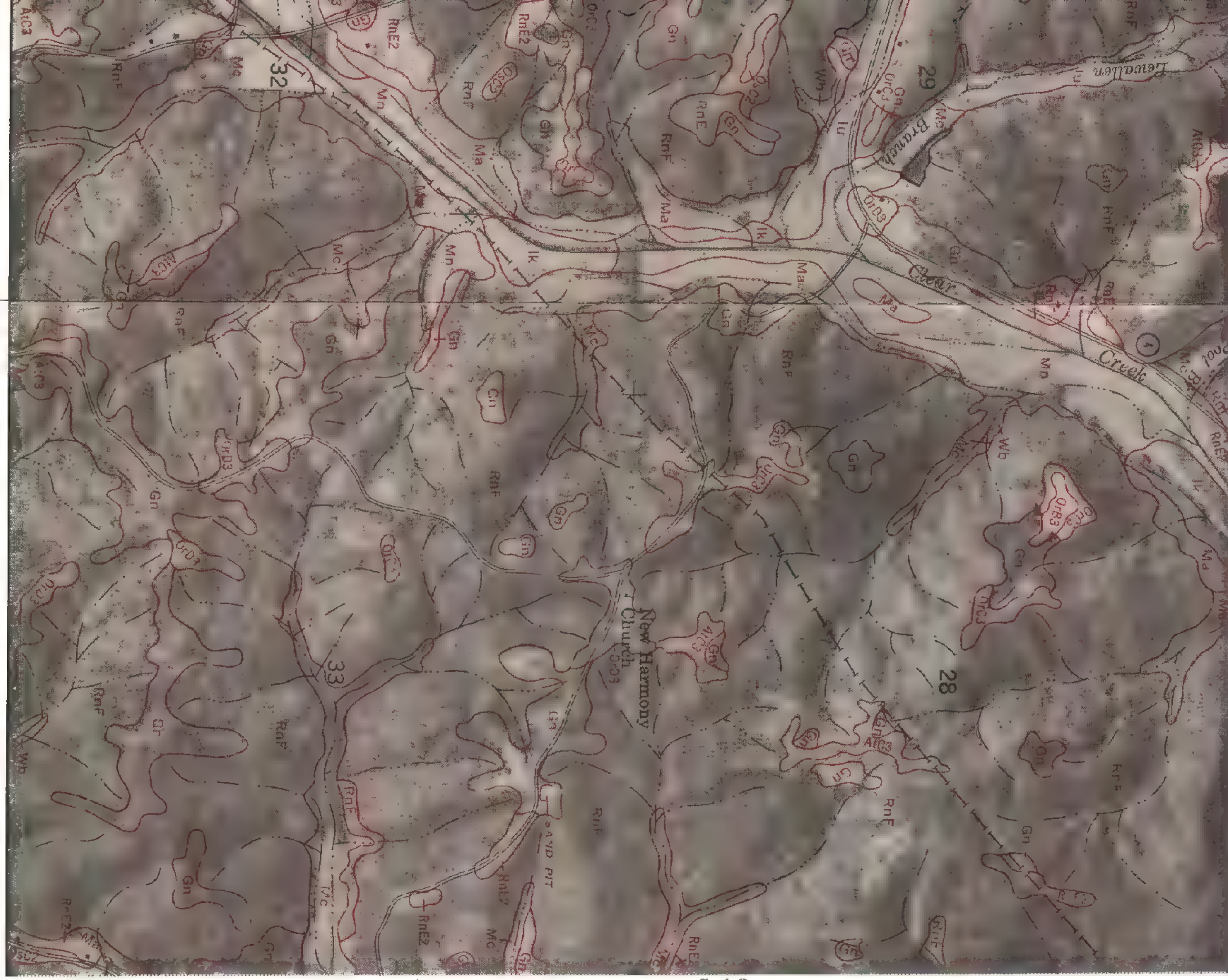
Scale 1:15 840

Scale 1:15840

0

3000 Feet

R. 5 E.



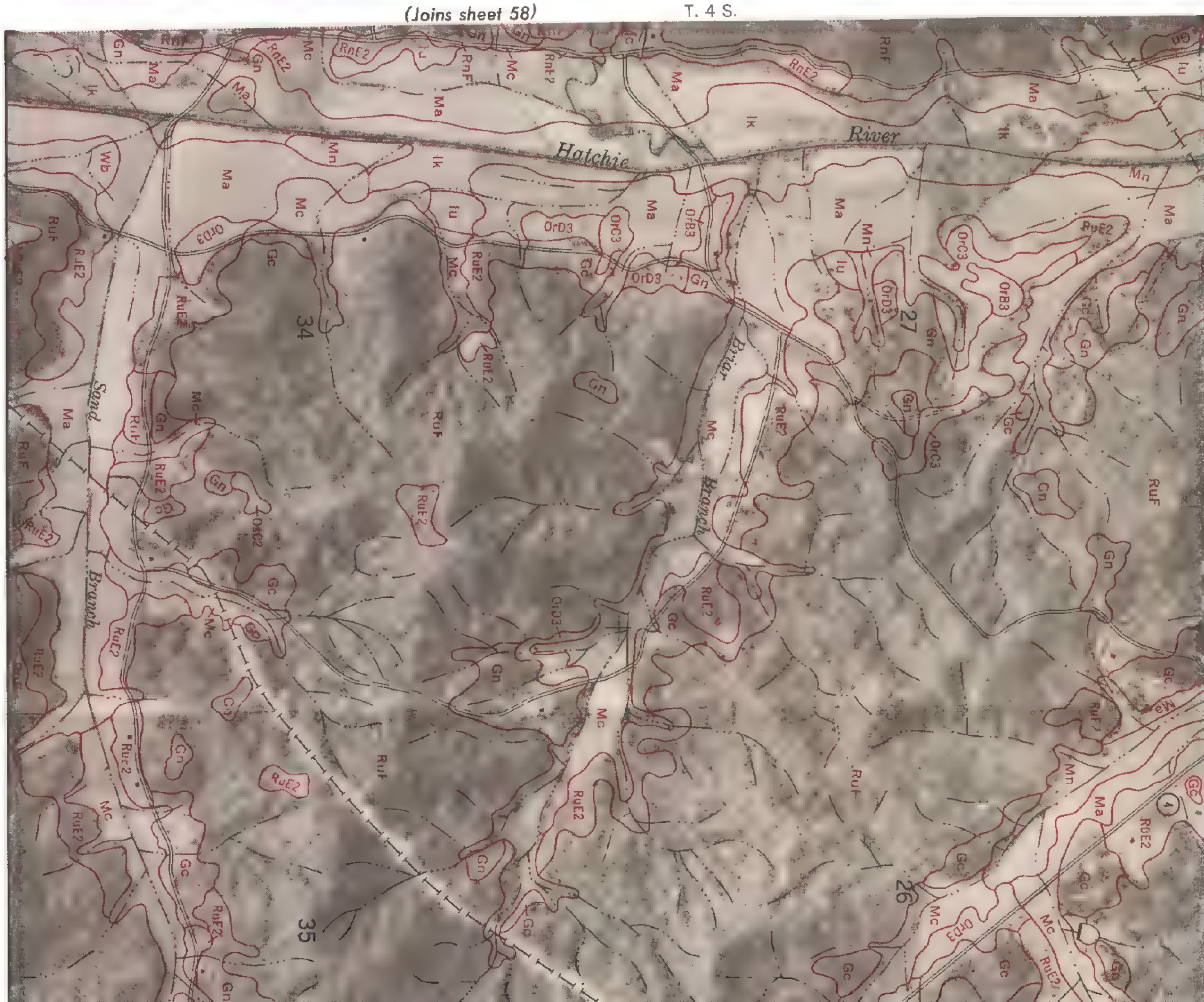
(Joins sheet 59)

T. 4 S

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

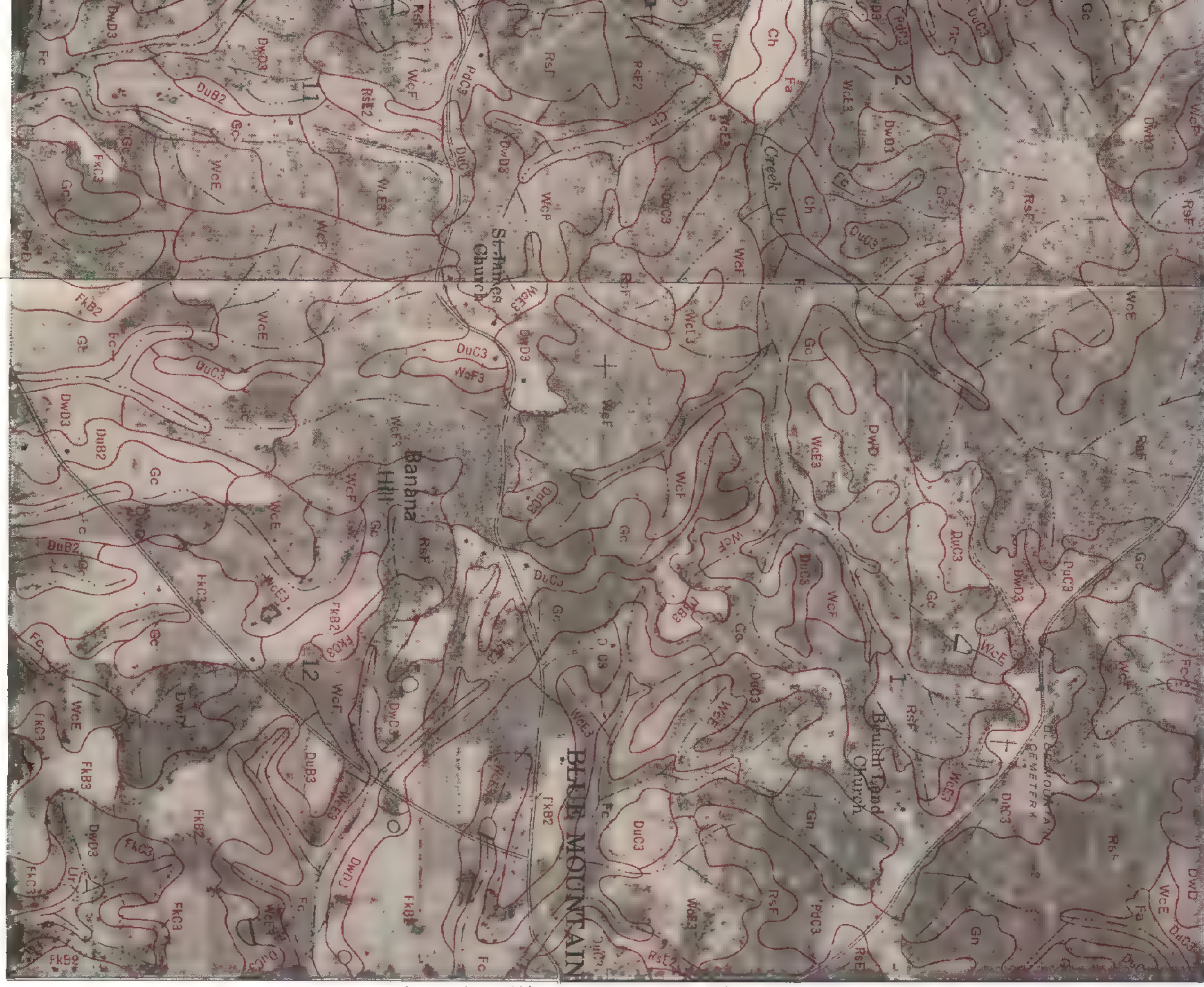
(Joins sheet 58) T. 4 S.



Scale 1:15840

0 ½ Mile

R. 2 E.



(Joins sheet 61)

T. 5 S.

Scale 1:15840

0

3000 Feet

½ Mile Scale 1:15 840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

R. 3 E.

Scale 1:15 840 0 3000 Feet

½ Mile
Scale 1:15 840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

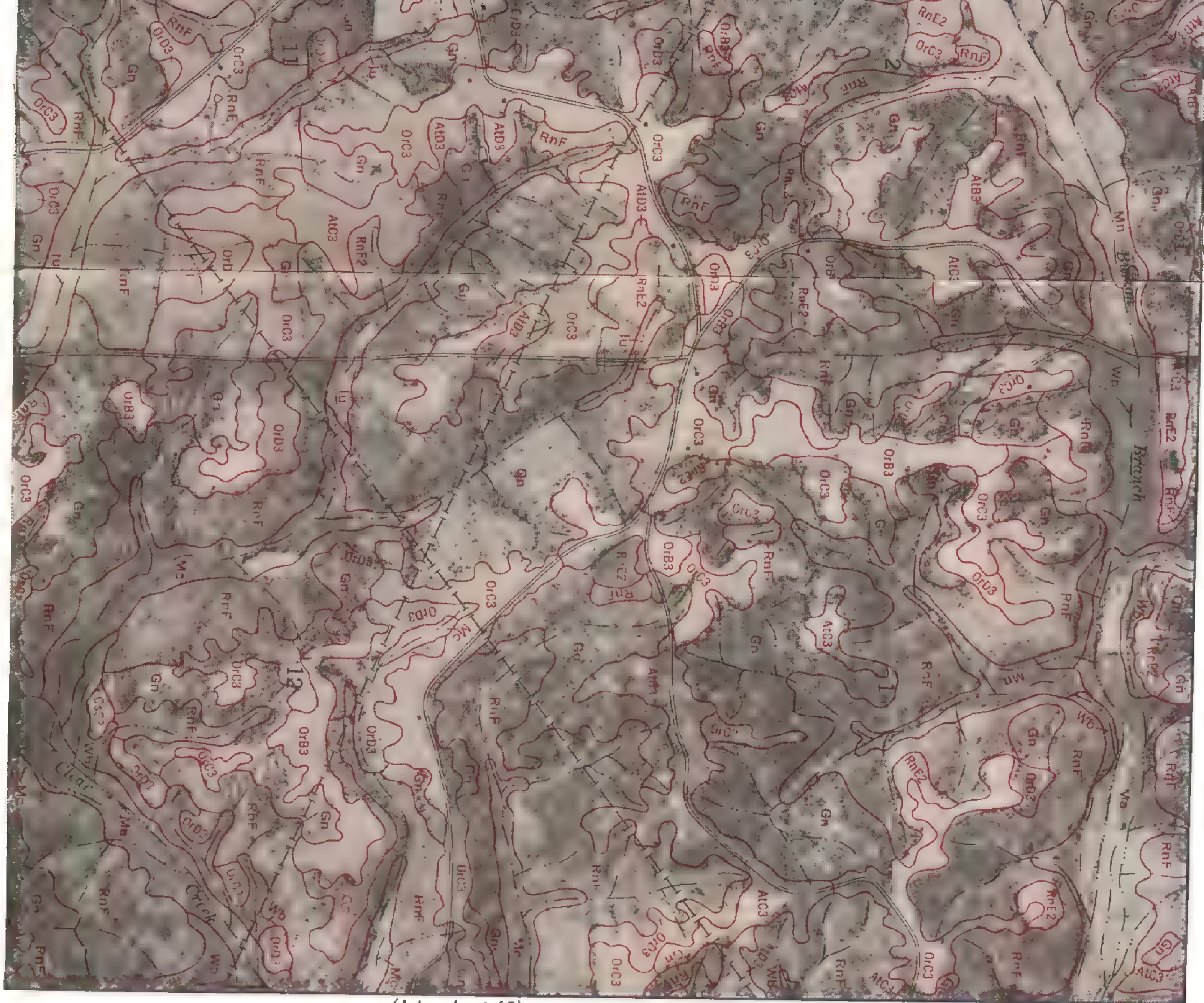
MISSISSIPPI — SHEET NUMBER 64

Scale 1:15840

0

3,000 Feet

R. 4 E.



(Joins sheet 65)

T. 5 S.

Mc

TIPPAH COUNTY, MISSISSIPPI — SH

R. 5 E.

T. 5 S.

(Joins sheet 64)

RnF

RnE2

0 ½ Mile

Scale 1:15840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

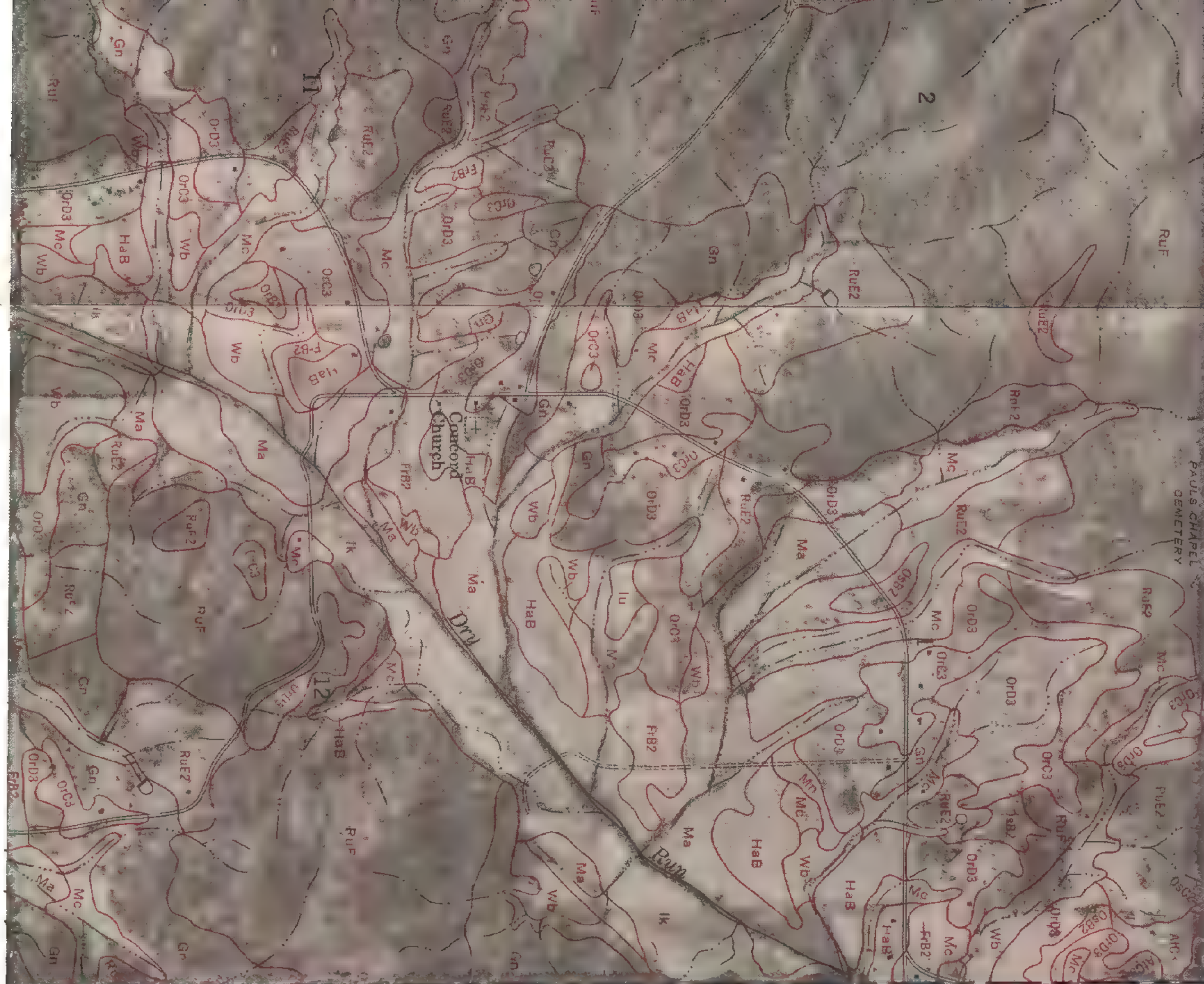
Range, township, and section corners on this map are indefinite

MISSISSIPPI — SHEET NUMBER 66

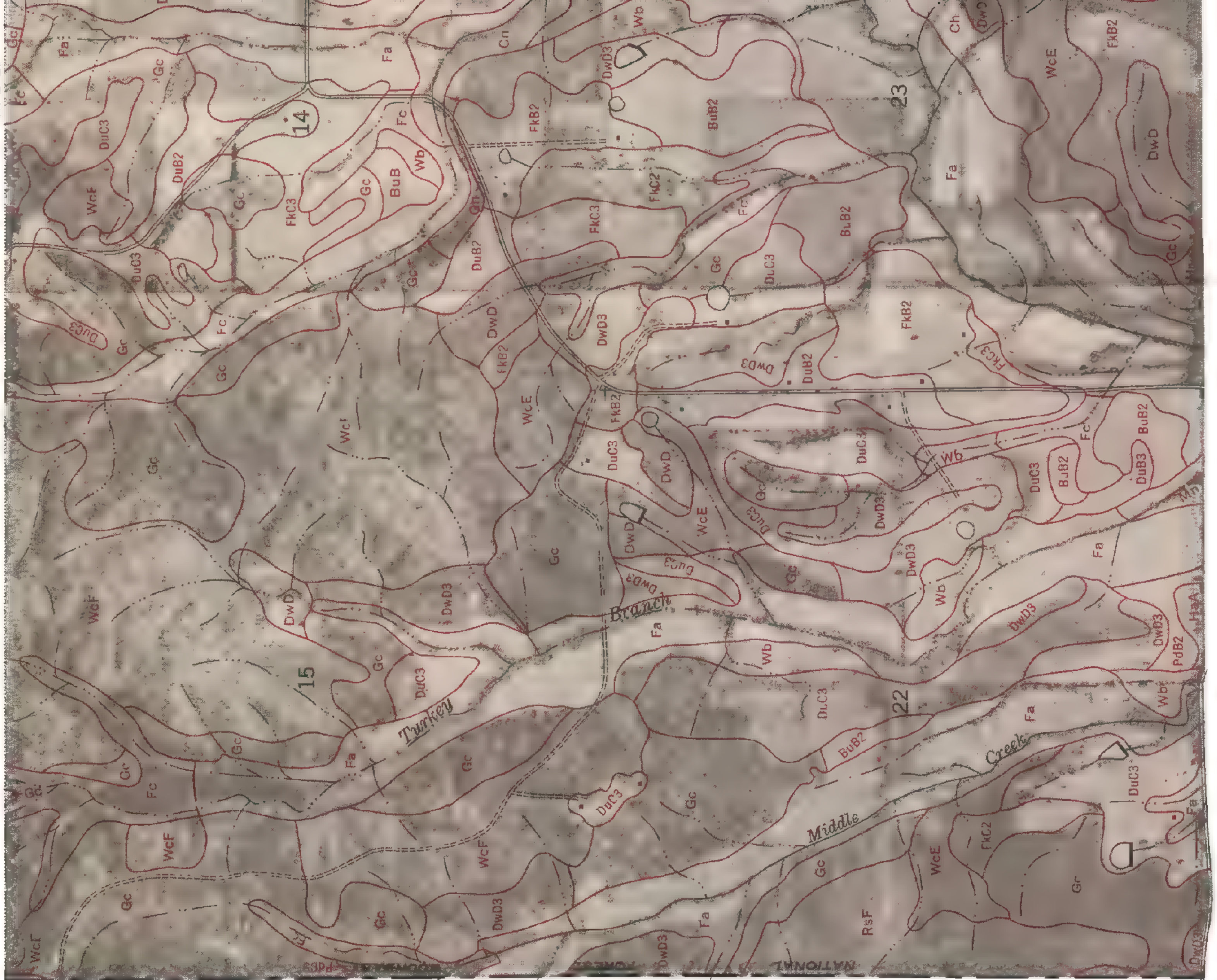
Scale 1:15840

0 3000 Feet

R. 5 E.



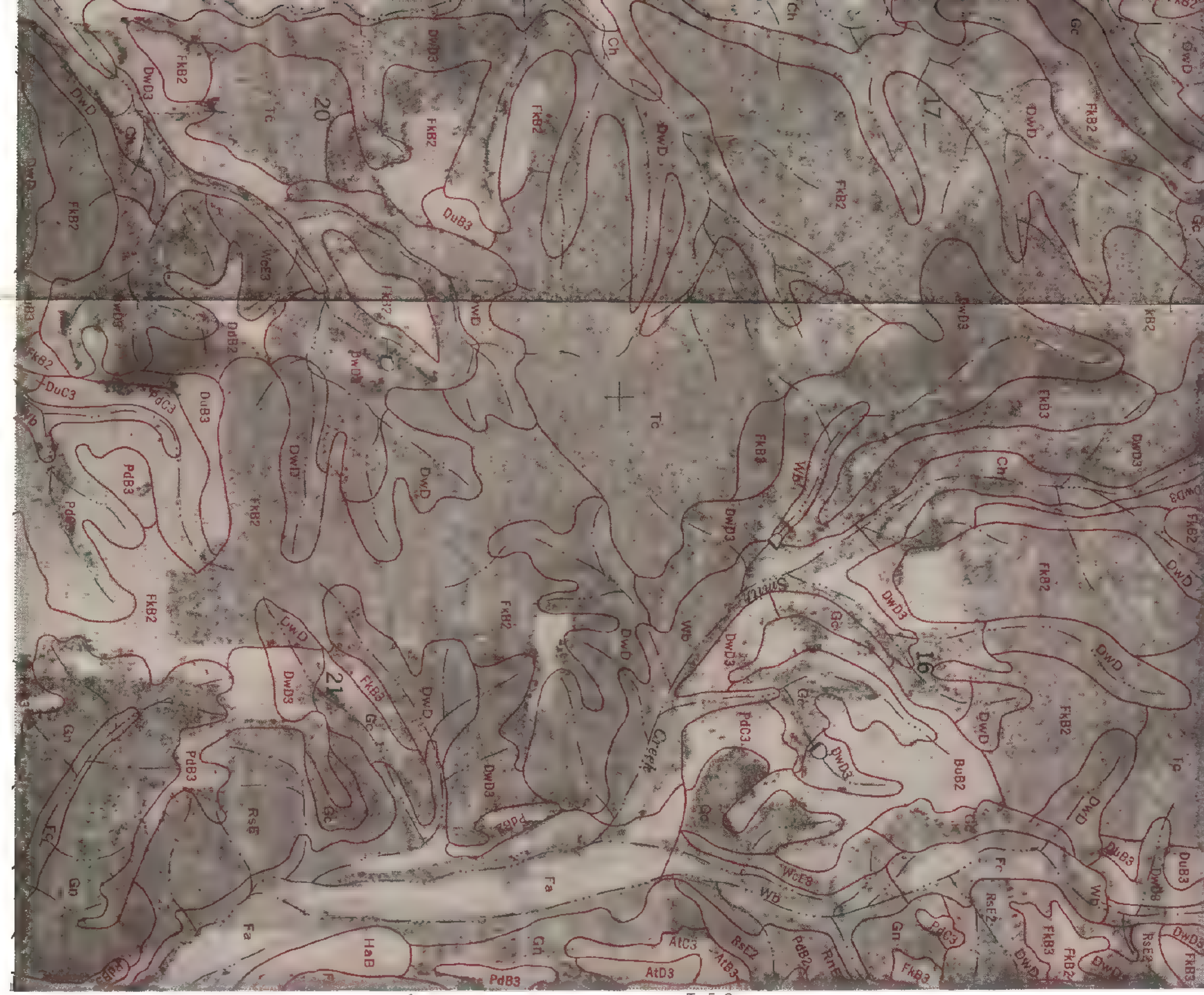
PRENTISS COUNTY T. 5 S.



Range, township, and section corners on this map are indefinite.

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture and the Mississippi Agricultural Experiment Station.

R. 3 E.



Scale 1:15840

0

3000 Feet

(Joins sheet 69)

T. 5 S.

½ Mile   Scale 1:15 840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

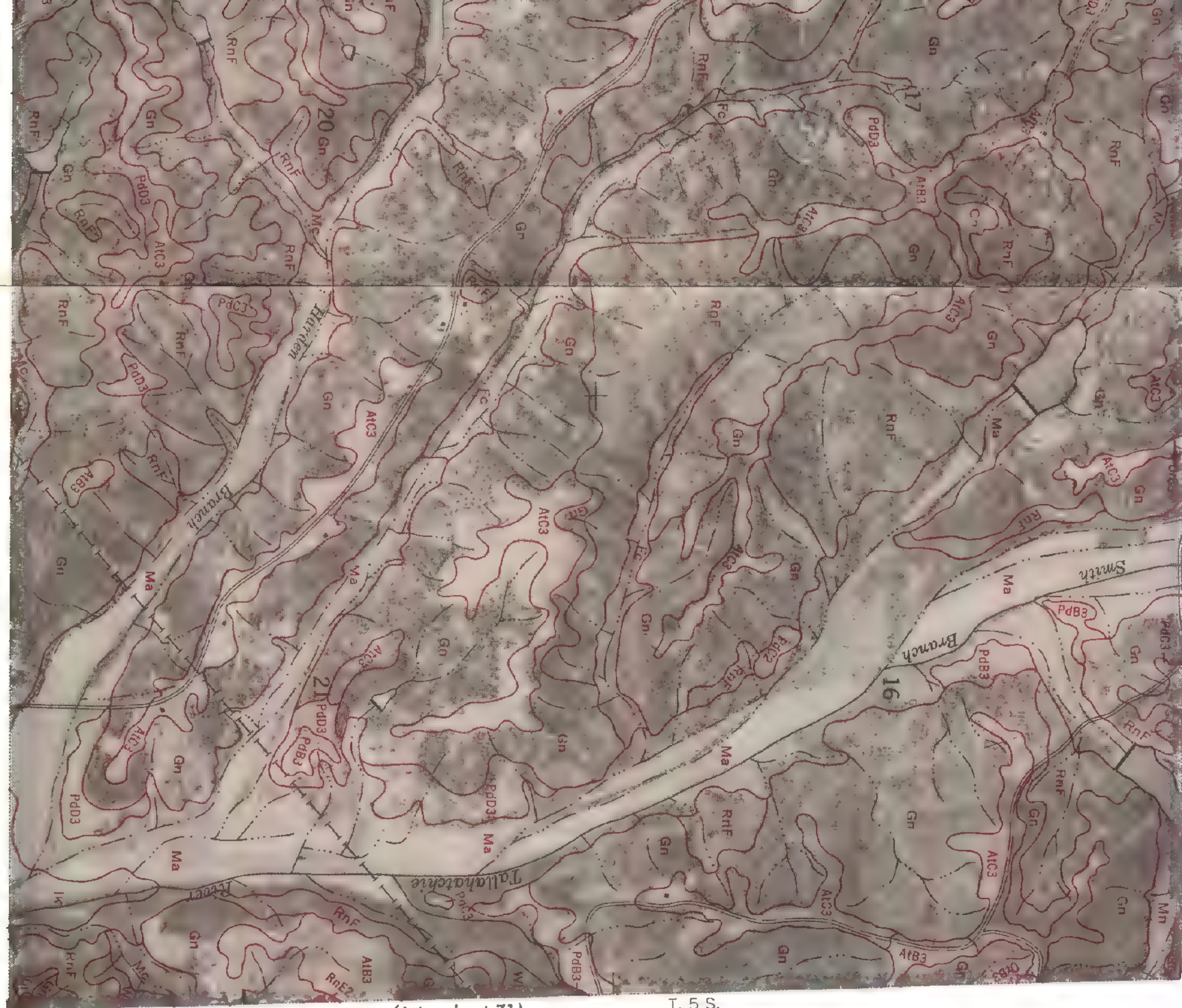
MISSISSIPPI — SHEET NUMBER 70

R. 4 E.

Scale 1:15840

0

3000 Feet



(Joins sheet 71)

T. 5 S.

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

R. 4 E.

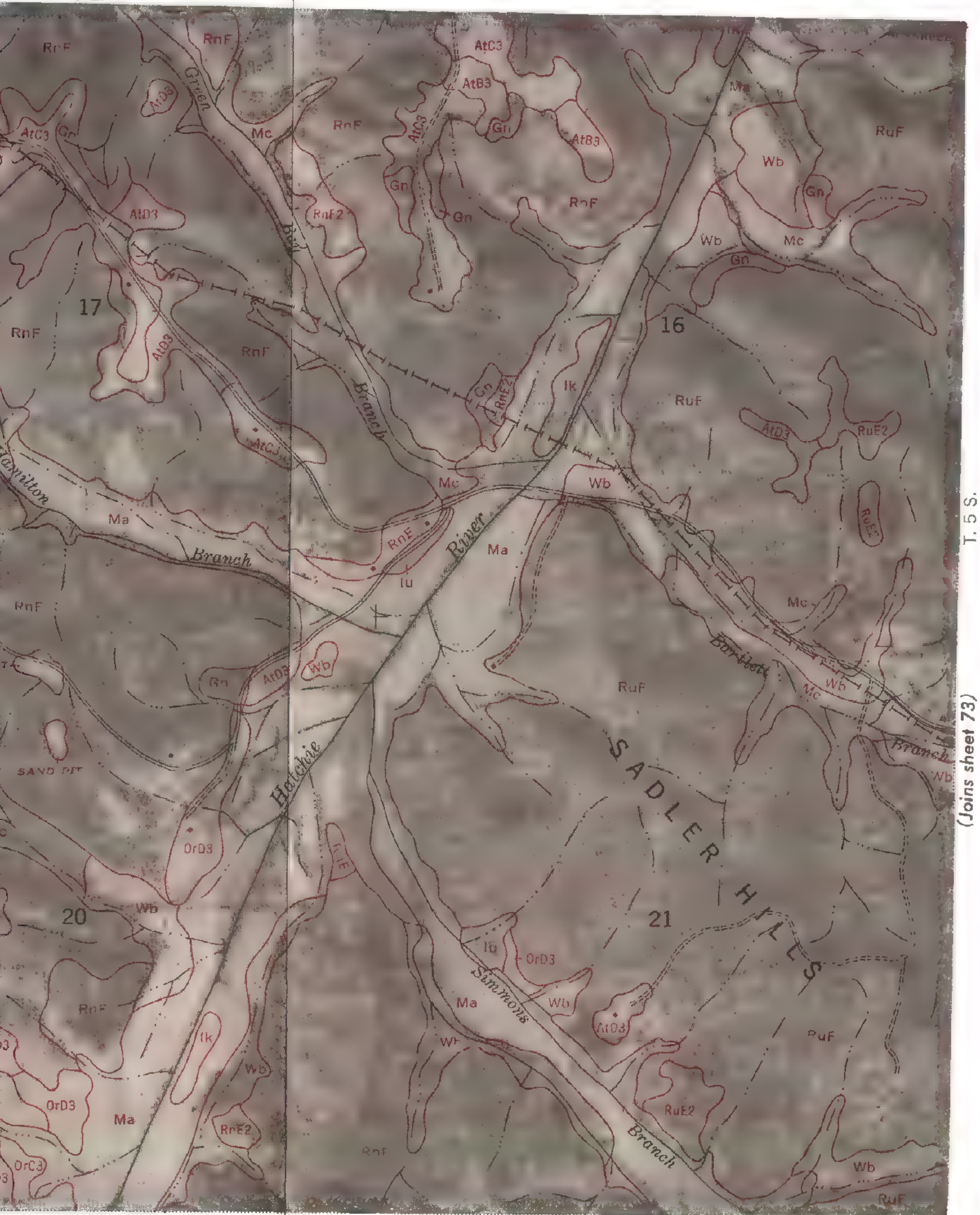
T. 5 S.

(Joins sheet 70)

0 ½ Mile Scale 1:15 840

MISSISSIPPI — SHEET NUMBER 72

R. 5 E.



T. 5 S.

(Joins sheet 73)

Scale 1:15840 0 3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

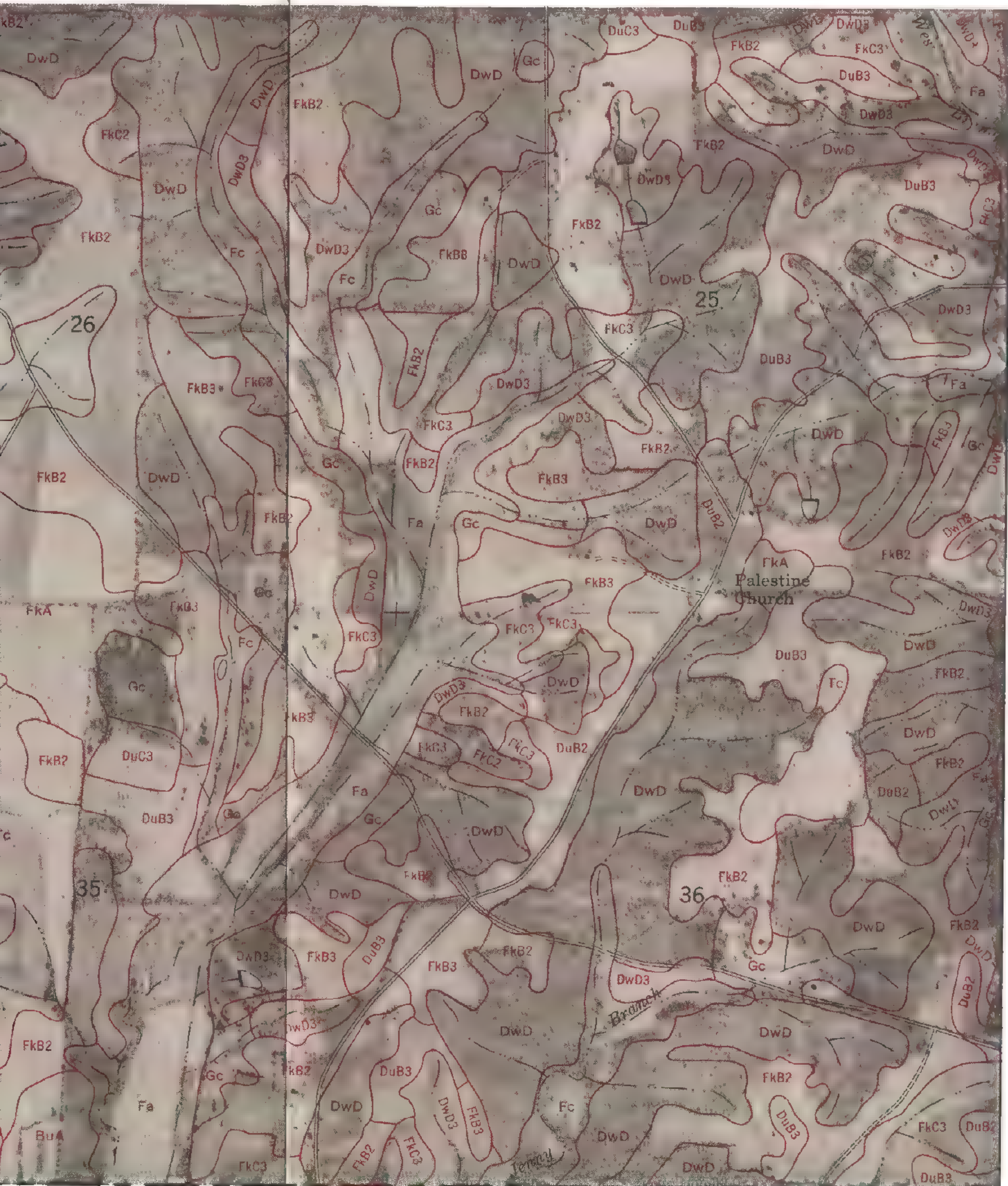
(Joins sheet 72) T. 5 S.

R. 5 E.

TIPPAH COUNTY, MISSISSIPPI — S

Scale 1:15840
0 ½ Mile

R. 2 E.



T. 5 S

(Joins sheet 75)

Scale 1:15840

0 3000 Feet

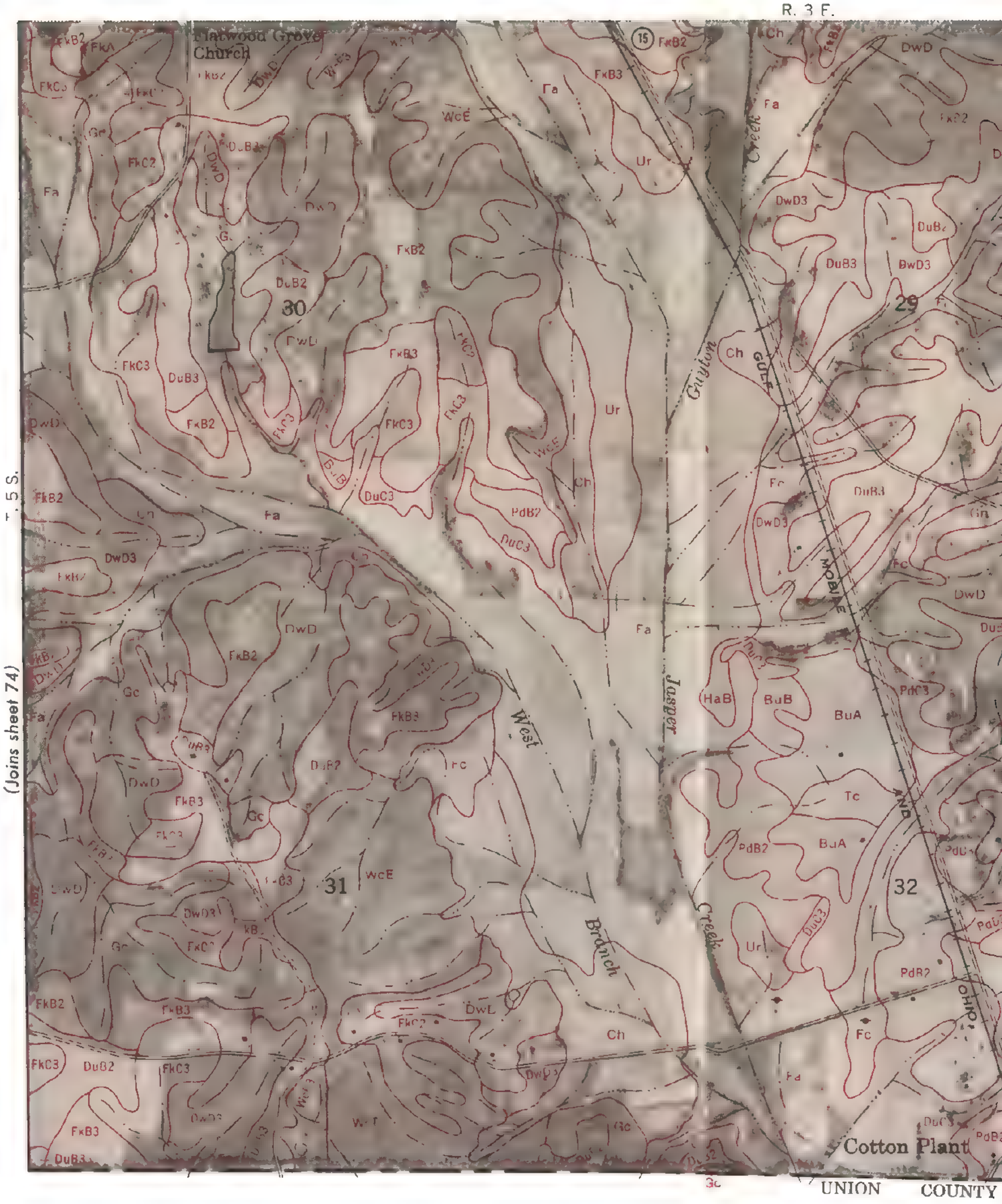
This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

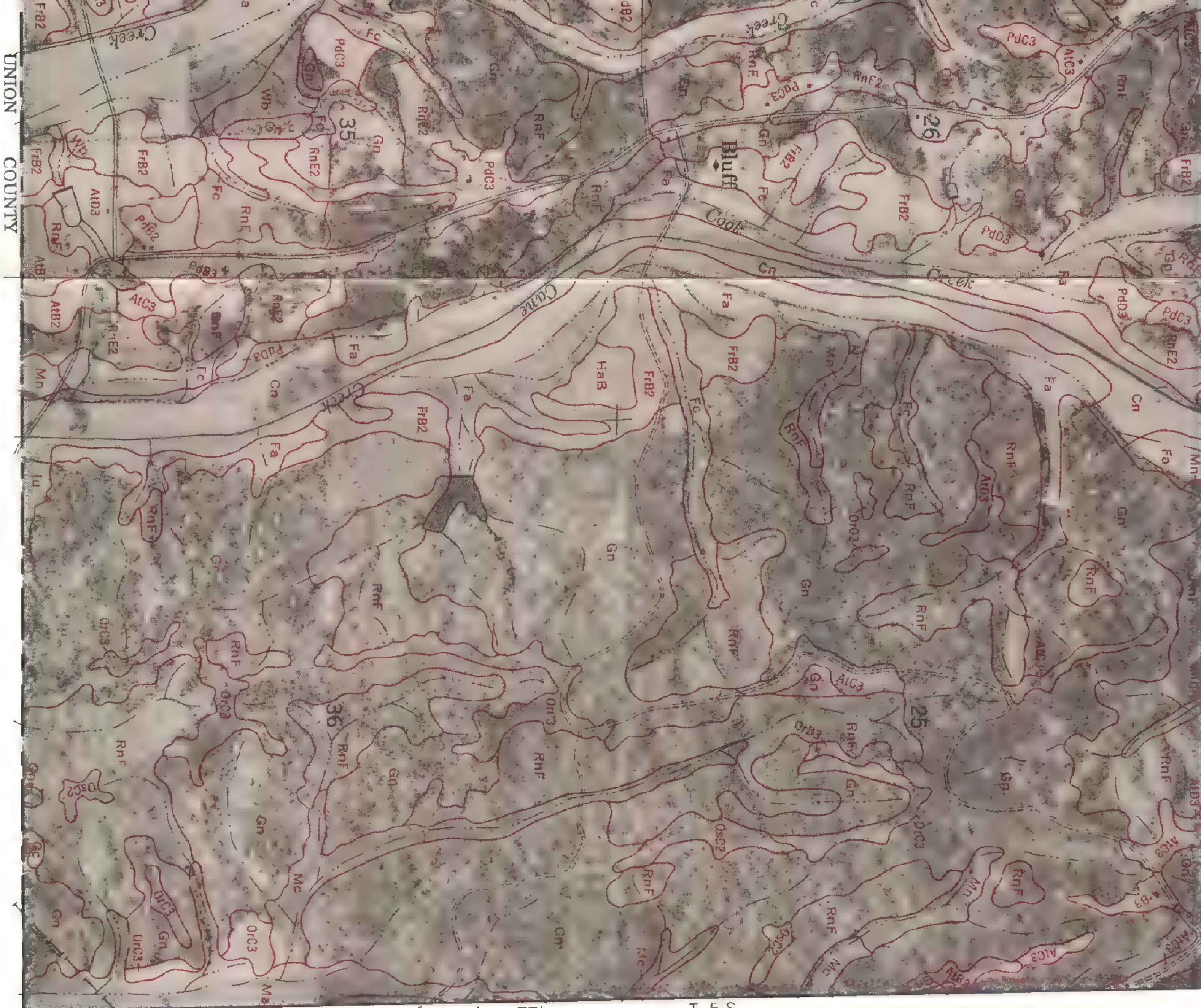
R. 3 E.

T. 5 S.

(Joins sheet 74)



0 ½ Mile Scale 1:15840



(Joins sheet 77)

T. 5 S.

Scale 1:15840

0

3000 Feet

½ Mile Scale 1:15840

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.

ISSISSIPPI — SHEET NUMBER 78

R. 4 E.

T. 5 S.

(Joins sheet 79)

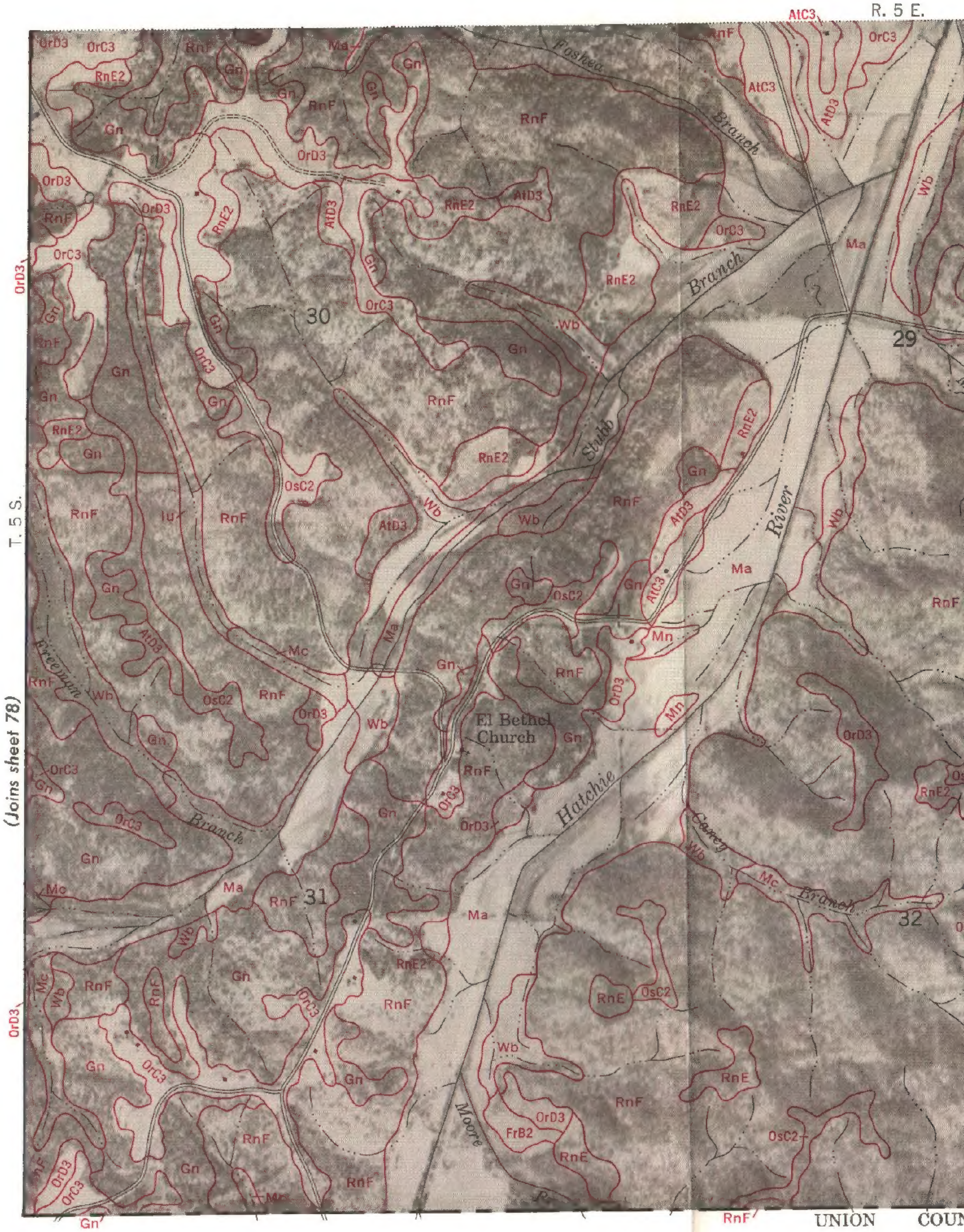
UNION COUNTY

Scale 1:15 840 0 3000 Feet

TIPPAH COUNTY, MISSISSIPPI —

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners on this map are indefinite.



0 ½ Mile

Scale 1:15 840

cale 1:15840

0 3,000 Feet

PRENTISS COUNTY T. 5 S.